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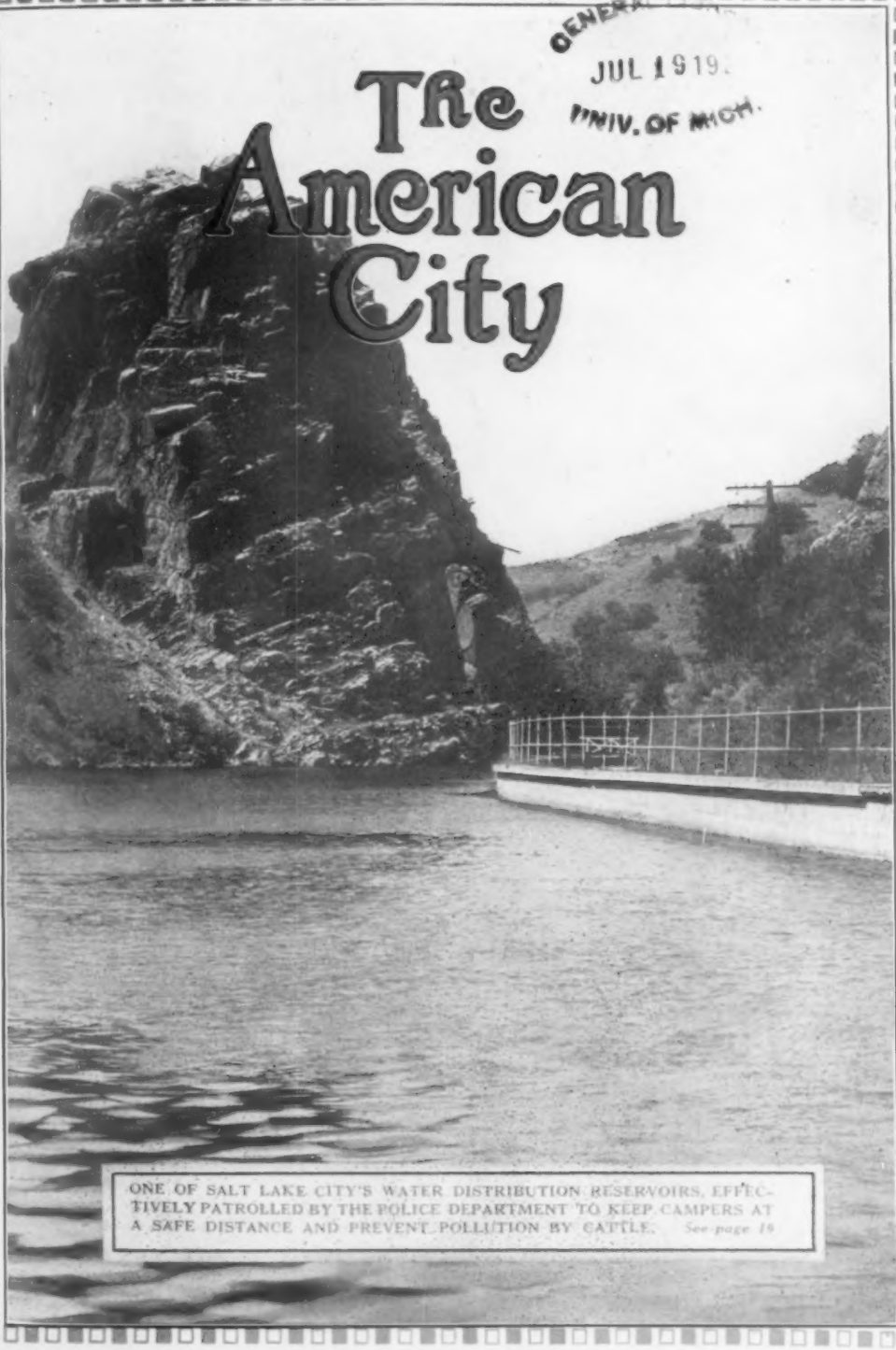
The American City



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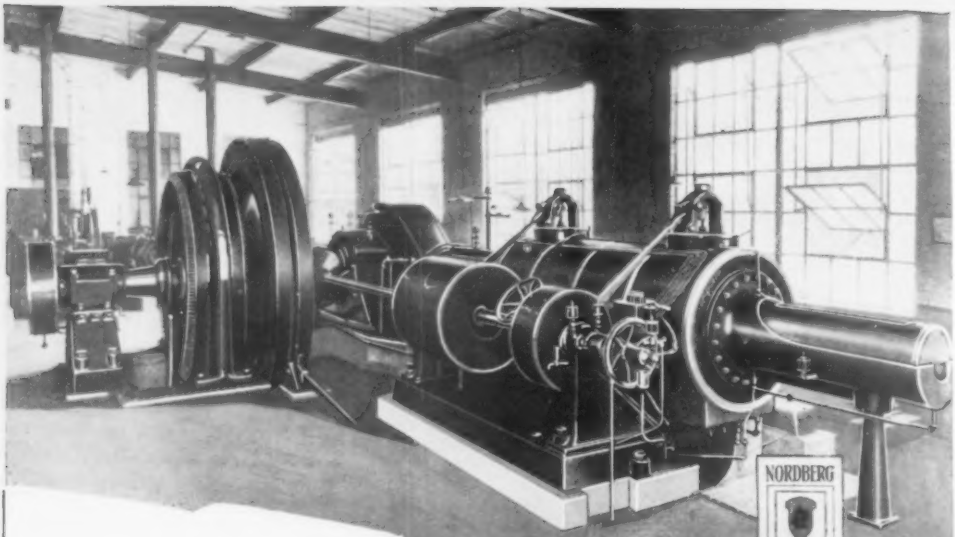

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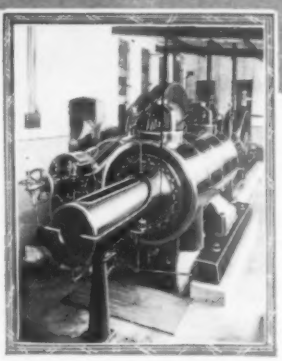

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The American City

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Municipal Progress in South Africa—The Garden City in the Land of Good Hope

By Rev. Thomas Pierce, M. A., S. T. B.
Chairman of the Public Welfare Committee, and Municipal Councillor, Uitenhage, Cape Province

FOR about four centuries Americans have looked upon Africa as merely the Dark Continent, the aboriginal habitat of the negro slaves of the Southern States. The travels of Stanley and Livingstone, the exciting events of the Boer War, and the hunting trip of the late Theodore Roosevelt, may have left some impression on trans-Atlantic minds; but this impression is too often a highly-colored view of a land of great adventure, all-pervading romance, trackless deserts, endless jungles, majestic beasts, and naked savage tribes. One might think that the enormous increase in the volume of trade between South Africa and the United States since the beginning of the late European war must have made this particular section of Africa better known in the great western republic. To a certain extent this is true. Financial, commercial and industrial interests in America no longer consider this country as merely the producer of one-

ONE OF THE ATTRACTIVE BUILDINGS OF THE GIRLS' HIGH SCHOOL, UITENHAGE, SOUTH AFRICA

half of the world's gold supply and nearly all the world's diamonds; it is now to American business men a promising field for investment and trade expansion. Yet many of these very merchants and capitalists, in common with millions of their intelligent and educated fellow-countrymen, have not the least conception of what this corner of the habitable globe is really like.

The Modern South Africa

When the writer of this article, who was born a few hundred miles from Washington, landed in Capetown some years ago he began to experience some of the biggest surprises of his life. Even the very negroes at the docks looked familiar. Many of them spoke English very passably, as well as their own native language and one or another of the many varieties of South African Dutch. And the city itself proved large, beautiful and perfectly modern. One felt quite at home in such a place, and had to wonder how on earth his ignorance could have been so crass!

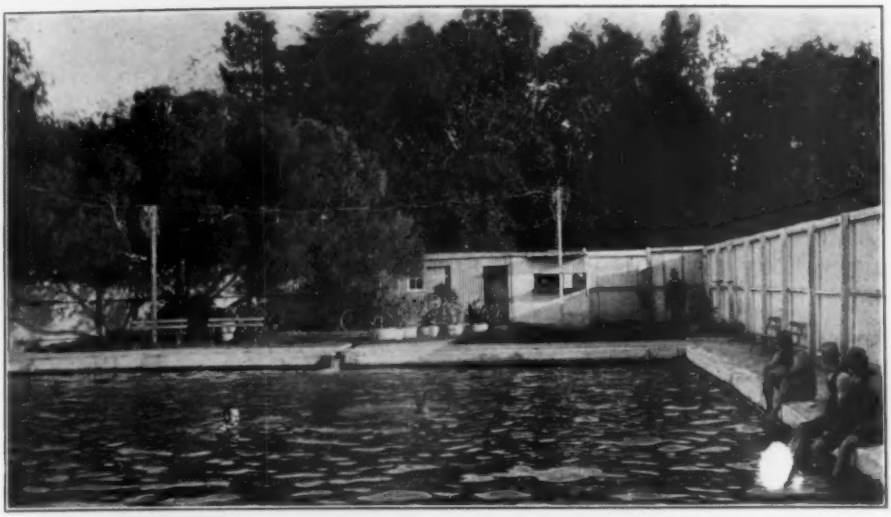
All preconceived notions of South Africa are very rapidly driven out of the minds of any son or daughter of Uncle Sam who may chance to come this way. There are no skyscrapers here, but such cities as Capetown, Johannesburg, Pretoria, Durban, Pietermaritzburg, Bloemfontein, East London and Port Elizabeth would adorn any country. They teem with life and are full of energy. Everywhere is evident a love of beauty and modernity. Trolley lines are found in all the big centers, and very often the trams, or street cars, are made in Philadelphia. Hundreds and even thousands of automobiles, motor trucks and motor-cycles fly over the paved streets and charming driveways, and it is safe to say that more than 75 per cent of these vehicles were shipped from some American port. The municipal and government buildings, the hotels, clubs, schools, colleges, theaters, churches, wholesale and retail houses are often very imposing and architecturally splendid. First-class libraries, hospitals and museums abound. Municipal swimming baths, parks and recreation grounds afford endless delight to old and young alike. Electric light and power is highly prized, even in the smaller towns, while here and there are fair imitations of Broadway or Michigan Avenue! Not a few cities and towns possess sanitary sewerage, and others are seeking this modern convenience and necessity of community life. In the matter of municipal abattoirs and meat and food inspection, South Africa is far ahead of the United States as a whole! Who, then, can travel over our network of railways and visit our cities and towns and still imagine that the Union of South Africa is not a progressive country?

Progress, of course, does not always come by leaps and bounds in any land. But it has a good grip on this rich and rapidly developing young nation. There is more truth than poetic fiction in the designation of South Africa as the "Land of Good Hope." In some quarters may be discovered a policy of ultra-conservatism, or even of opposition to modern progress, but the majority of the people, especially in the towns and cities, are daily becoming more and more enamored of the policy that we call progressive and public-spirited.

A very good example, in proof of this assertion, may be found in Uitenhage, where the writer resides. This is a town of about 14,000 souls—not a very big place, but a place with a future. It is situated on the main railway line between Capetown and Port Elizabeth, and only 21 miles from the latter city, which is one of the chief seaports of the Union. There are large railway workshops here, two wool-washeries, a tannery, an extensive nursery, a clothing factory, a boot and shoe factory, several brick kilns, and some minor industries. Many large market-gardens ship their produce to all parts of the Union. Because of its gardens, nursery, parks, trees and wide-spread floriculture, Uitenhage is known as the "Garden City" of this Colony. It is also one of the principal educational centers in the Province, possessing, as it does, besides the half dozen public and parochial schools for primary and kindergarten education, a Training College for European teachers, and another for colored teachers; a High School for boys and one for girls; an industrial school for boys; and the Marist Brothers' College, which is the headquarters of this community in South Africa, and a very commodious establishment.

Plans for Future Public Works in Uitenhage

The Uitenhage municipality owns its electricity plant, water-works and abattoirs. It carries on the waste removal service. Last



MUNICIPAL SWIMMING BATH AT UITENHAGE, SOUTH AFRICA

year the writer brought forward a rather comprehensive scheme of town improvements, but the only feature that was eventually adopted was the purchase of two electric lorries for the sanitary removals. Uitenhage is the first place in Africa to use motor transport for such a purpose. Not deterred by the fate accorded to that first big scheme, the writer proposed a still more ambitious one in the month of October, 1920, seven months after his initial defeat. The people had been thinking in the meantime, and a far better reception was given to this new proposition, which included the augmenting of the water-supply by the construction of a conservation dam on the river, twelve miles from town; the metering of the entire domestic and industrial water-supply; the installation of sanitary sewerage for the town and native location; the paving or repaving of all the streets after sewers had been laid and water-mains cleaned; and the extension of the municipal tree-planting area. The estimated cost of these works and improvements was £300,000. An uncivic clique of obstructionists, who had been accustomed to having their way for a quarter of a century or more, naturally gave battle. The Council itself refused to have anything to do with such a scheme. It was said that Uitenhage could not afford to spend so much money; that the cost would be two or three times the estimated sum; that part of the scheme was good, but the remainder of it was hopeless, or "too previous"; that the Councillor who originated it didn't know what he was talking about, and so on and so forth.

Nevertheless, at a public meeting of the rate-payers, a 40 to 1 majority was secured for a mandate to the Municipal Council, compelling them to have the scheme investigated by competent engineers and accountants, and then to resubmit it for the approval or rejection of the enrolled voters. Only 11 persons out of more than 400 present voted against this resolution, and 7 of the 11 were Councillors! The opposition then demanded a poll, which was held 19 days later, and resulted in the confirmation of the mandate by 652 votes to 459, a majority of nearly 200, with 1,111 ballots out of a possible 1,700 being recorded.

Thereupon the investigation of the scheme began. A committee of three Councillors, with the writer as chairman, was appointed, with power to act in the matter. Tentative quotations were sought from South African, British and American firms. Consulting engineers prepared plans and specifications and cost estimates for the dam, the sewerage system and the road-making program. It was found that the author of the scheme had not been out 3 per cent in his original estimate of the total cost. The enrolled voters will be asked to approve the scheme within the next few weeks, and it is morally certain that they will have done so before

this article is read in the United States. The attitude of the townspeople is altogether favorable. This may be judged from the fact that, owing to the nature of the opposition raised against the scheme, and the stubborn refusal of nearly half of the Councillors to carry out the mandate of the citizens, a Public Welfare, or Vigilance Committee, was formed in December last, and the writer was unanimously elected by the enrolled voters to serve as Chairman.

Now, when Uitenhage has completed these public works and improvements, it will be one of the prettiest and most desirable residential towns that one could wish to see. No place in Africa will possess superior advantages; there is no city or town in Africa that has universal sanitary sewerage, a 100 per cent metered water-supply, or modern pavements on every foot of its streets and lanes. It is proposed to relay any defective water-mains, to attend to underground cables, and to lay service connections, even for unimproved lots, from the water- and sewer-mains to the outer edge of all paved streets, so that future extensions will not necessitate the tearing up of the asphalt pavements. There will be a parking space between the roadway and sidewalk curbs, and trees will be planted where none now grow, although the town is at present extremely well provided with shade trees of oak, gum, pine, Grevillea, etc. The municipality has a tree plantation today, but other and much larger sections of the commonage will be devoted to the cultivation of trees with a commercial value as mine-props, timber, etc. It is also proposed to clear and subdivide several hundred acres of the best irrigable land on the commonage nearest the town, and rent or sell these blocks for gardening as soon as the water from the conservation dam is available. The sewerage farm of more than 300 acres will bring the municipality a net annual revenue of something between £2,000 and £4,000. The revenue in sight from this farm, from the tree-planting and from the sale of commonage lots, will more than pay for the entire scheme within the life of the loan!

Administrative Reforms Proposed

There is provision made also in this town improvement scheme for the reorganization of the municipal administration, and the creation of three new departments. At the next Municipal Congress, to be held in 1922, the writer intends to move a resolution asking the Administrator and Provincial Council to legalize the raising and repayment of municipal loans by the sale and redemption of serial bonds, and to render possible the adoption of the town manager plan of local government. At the present time, municipal loans are repayable by annuities or sinking funds, but the writer has reason to believe that the serial bond method will be duly authorized, provided it is approved by the Congress of Municipal Councillors and Officials, as it certainly will be. As regards the town manager plan, some of the largest cities in the country have been investigating this method for the past two years or more. It appeals to the business instinct, and to the universal desire for greater efficiency and economy in the administration of municipal affairs.

According to our laws, proportional representation may be adopted for the election of Councillors, if the enrolled voters approve a petition to that effect. Within the next month the Uitenhage Public Welfare Committee is going to call a public meeting in advocacy of proportional representation, explain the advantages and operation of the scheme, and conduct a model election for the purpose of elucidating the method of voting and counting. Later on, another meeting held under the provisions of the Cape Municipal Ordinance of 1912 will be asked to forward the required petition to the Administrator. In a general way, the people already understand the superiority of proportional representation over the old ward system, and they are demanding relief from the many evils that the latter method of election has produced. There is no doubt that the Welfare Committee's proposal will be approved by 80 per cent or even 90 per cent of the people; only the corruptionist and obstructionist "die-hards" will oppose it. But their day is at an end. The two local papers, as well as the vast majority of rate-payers and enrolled voters, are now supporting a program of progress.

The new spirit that has manifested itself in Uitenhage has been aroused in many other towns and cities in South Africa. When times become more normal, there is certain to be a rapid development of civic pride and progressiveness, to keep pace with the growth, prosperity and higher ideals of the country.

The Protection of Public Records

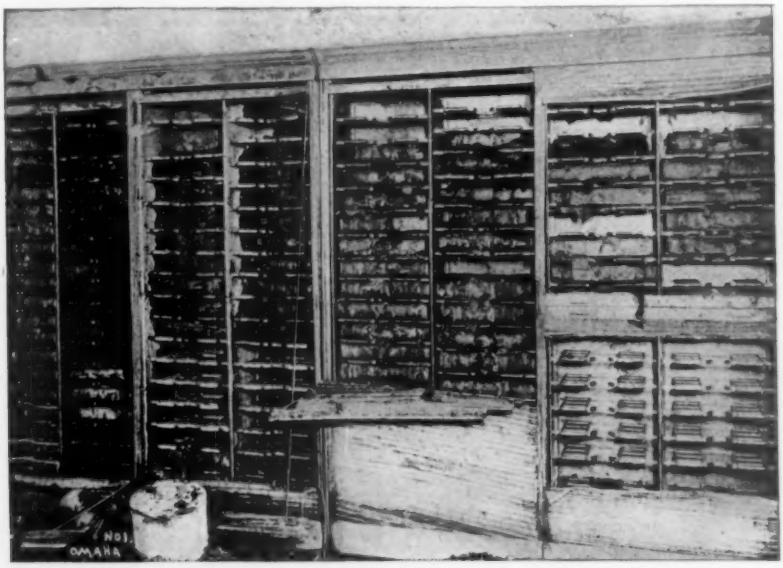
By M. L. Carr

IT is probably no exaggeration to say that hundreds of tons of public records are not protected at all from fire, and that large quantities are given little, if any, protection from careless handling, loss and the ravages of time. The writer once had occasion to consult certain public records in one of our western states, and chanced upon the records of the marriages and births of that community so sadly neglected that loss through carelessness, or worse, of clerks and the curious was inevitable. This court house, by the way, has since burned, and all the records of years have gone up in smoke.

It would seem self-evident that, if an event or a transaction is of sufficient importance to make a record of it, the record is sufficiently valuable to preserve. In fact, the word "record" connotes preservation. If we are too careless, too indifferent, or too penurious to make the necessary provisions for preserving our records, it would be better to sell those of historical value as museum specimens.

It is useless to speculate upon the reasons for our national failing in this respect, except for the fact that the reasons may suggest methods by which it can be changed. Neither will looking at fire ruins or the pictures of fire ruins bring about any change unless they are studied with a view to devising means of fire prevention and fire protection, except for such value as they may have in drawing public attention for the moment to the subject. What is most needed is some form of propaganda, or campaign, to direct public attention to the subject, and definite plans made for providing protection if public sentiment is sufficiently aroused to demand it. Whether or not a public campaign would be worth while depends to a large extent upon the possibility and the feasibility of providing the necessary protection. Obviously there is no use in creating a demand for something that cannot be furnished.

Even though the science of providing protection for modern business records is



THE FATE OF RECORDS ON OPEN SHELVES IN THE OMAHA COURT HOUSE FIRE, SEPTEMBER 28, 1919. METAL CONTAINERS AFFORD NO PROTECTION

young, much progress has been made, and protection can be provided that at the same time meets the needs of present-day business. One reason for the unprotected state of public records is the fact that the volume of them has grown far beyond the capacity of the containers originally provided, on account of the increase in the number and extent of governmental activities, and because we now have facilities for making more and better records. The record containers our grandfathers provided are not adapted for housing the voluminous correspondence, card indexes and other modern records now necessities of our life.

Make a Survey of the Building

Any decision to provide more record protection in an existing building, either public or private, should be put into effect systematically, and not in a haphazard manner. The proper method of procedure, as would naturally suggest itself to anyone, is to make a comprehensive survey of the building in order to determine what records are in it, how they are housed, and, last but not least, the kind of building considered from the fire protection view-point.

A survey of the records includes notation of their kind, volume, relative values, and distribution throughout the building. It will probably reveal a large quantity of many kinds of records, varying from those of little to those of inestimable value, with even chances that the most valuable ones are in the most hazardous situations. It may even be found that there are large quantities of no value that could be disposed of, thereby yielding space.

A survey of the record containers in use will mean listing them with reference to the records they contain, and an appraisal of their value considered from the fire protection view-point. It will probably reveal everything from open shelves to vaults. Wooden and metal filing cabinets afford protection for only a few minutes against fire of any considerable severity. Furnace tests of wooden and metal cabinets have shown the two kinds to be about on a par in so far as the degree of fire protection they afford their contents is concerned. While steel will not burn, it transmits heat rapidly, and the safety of records in close proximity to red-hot metal is easily imagined. Wooden cabinets transmit heat more slowly, but will themselves burn.

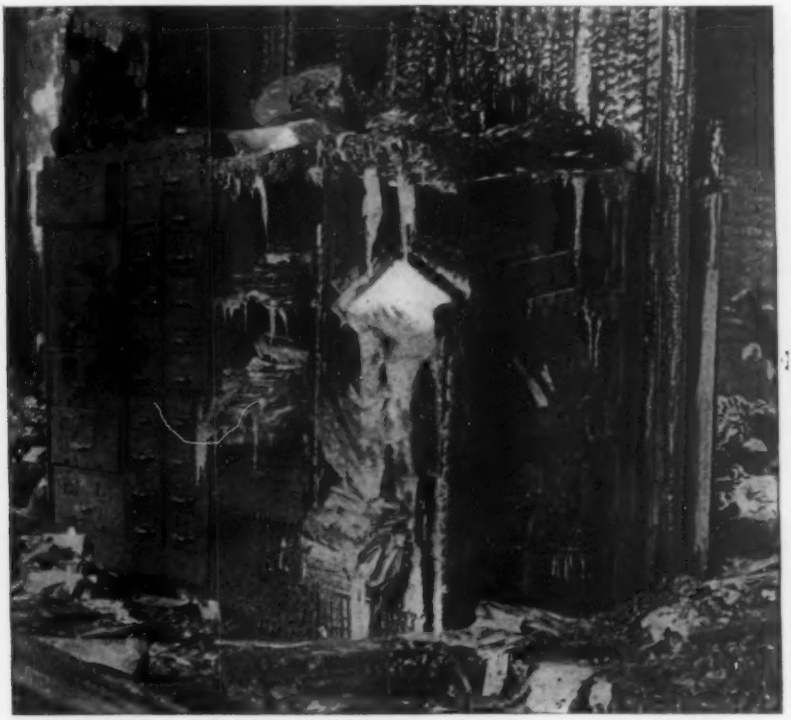
The fire protection afforded by safes of the cabinet type is easily ascertained if they bear labels of the Underwriters' Laboratories. If they do not bear such labels, the degree of protection afforded can only be guessed at. If their walls are hollow, with no insulating material in the walls, they will afford protection to contents for not more than a few minutes, that is, practically no protection except from a fire in its incipient stage. There are unlabeled cabinets on the market with insulation in their walls, but as the degree of protection they will afford is an unknown quantity, it is safest to assume a very low value in appraising them.

When we come to the old-style safes of the conventional type, we are confronted with another problem in appraising their fire-resisting value. The volume of records stored in old-style safes is likely, however, to be small in comparison with the total volume of records in most large public buildings.

The most difficult appraisal will be that of the vaults. The Baltimore, San Francisco, and numerous smaller fires have shown that there is much misplaced confidence in vaults. It is not safe to judge a vault by appearance, especially one with thin walls. Plaster hides a multitude of defects and lends an appearance of solidity to a very frail structure. Unless someone who really knows what is good building construction can vouch for the character of the vault walls, the only safe thing to do is to remove the plaster and make an examination, a course that is certainly not proceeding along the lines of least resistance in making the survey. Fire will remove it, though, and find the hidden defects. Fire will do what prudence neglects. Common defects in vault construction are walls lacking in fire resistance, insecure supports, such as unprotected structural steel, holes and cracks in walls, uninsulated doors, lack of inner doors, poorly fitted and insecurely mounted doors. A vault recently examined was found to have a crack in a corner through which daylight could be seen. Fortunately, it happened not to have been severely exposed by the fire which destroyed the building.

A survey of the structural features of the building is necessary, of course, in order to afford a basis for judging the probable severity and duration of fire which may occur in it, and determining whether fire will spread rapidly without much prospect that

it can be brought under control, or whether it can be confined to one section of the building, thus giving the fire department a chance. A survey of the average public building is almost certain to reveal open stair shafts and other ideal channels for distributing fire throughout the structure. The amount of combustible material in the building itself will vary from practically nothing to all of the material in it.



PROTECTION AFFORDED BY WOODEN FILING CABINETS IN NEW YORK BOARD OF EDUCATION FIRE, FEBRUARY 1, 1918

Some of the records were not destroyed, but it was apparent that a fire stream, and not the container, saved them

Make Use of the Survey

Provided with the data of the survey, the next step is to study them with a view to utilizing to best advantage the record containers already in use, and to determine the kind and amount of new equipment needed. First relegate to containers of low or unknown fire-resisting qualities stationery and records of very little value. This probably means shifting such containers to different parts of the building. Do the same for other containers so far as floor strengths and weights will permit, so as to provide containers possessing the requisite fire resistance for the situations. Experience and judgment are at present the only guides for doing this, and a competent fire protection engineer should be consulted.

For records not housed, it will probably be found that the modern approved metal filing cabinet is the only type of container that it is practicable to use. The old-style safe is out of the question, if any considerable volume of records is to be taken care of, because of small storage capacity for its size and weight and because it is not, as a rule, adapted to housing filing equipment.

New vaults in convenient locations will in all probability also be out of the question in the average public building in need of additional fire-resisting storage capacity.

Under such conditions floor space will already be at a premium. Even if this is not the case, structural and architectural reasons will usually prevent their being built in locations convenient for daily use and where proper support can be provided. It obviously would be a very expensive proposition, for example, to build a fire-resisting vault on any but the ground or basement floors, and to provide supports that will not give way when subject to fire in an existing building with wooden floor beams. If the building is sufficiently modern to be of really fire-resistive construction, vaults can, of course, be provided on any floor, but they are wasteful of space and clerks' time and are unnecessary. It increases office efficiency greatly to provide each group of clerks with a safe conveniently located. Safes are necessary, however, to protect records, as combustible contents of such buildings can burn. The greater the amount of combustible contents, the better the safes must be, and conversely.

There is a place where vaults can be built to advantage in old public buildings and utilized to house non-current records, and that is in basements. This means that fewer and smaller safes will be required in the working spaces.

When record protection is mentioned we are inclined to think only of safes and vaults and to forget that any measure which lessens the fire hazard of the building reduces the danger to records in it. In other words, if we looked upon the entire public building as a record container, a huge safe or vault, as it were, we might take the question of providing better fire protection more seriously.

The installation of an automatic sprinkler system in a public building would be much cheaper than replacing the building. West Virginia doubtless would have its Capitol today had it been equipped with an adequate sprinkler system. If we could persuade our architects to enclose open stairways with wired glass, even, rapid spread of fire in its incipient stages would be hindered, thus giving fire departments a better chance. True, wired glass is not the ideal material to use, but it is preferable to nothing. It will be on duty twenty-four hours a day, whereas esthetic senses sufficiently refined to be injured by its use may not be jarred more than a few times in a year. It is by no means proved to the layman that vertical openings in buildings are not susceptible to architectural treatment which will render them safe without making them eyesores. Ira H. Woolson, of the National Board of Fire Underwriters, finds that 80 per cent of our fire losses and 90 per cent of the losses of life are due to unprotected vertical openings in buildings.

Our records are not all made with paper and ink; some are in brick and stone. Who will say that Independence Hall is not as much a record of our early history as the Declaration of Independence or the Constitution of the United States, so inadequately housed at Washington? The Capitol of West Virginia, with all the associations which years attach to a public building, was no less a record of the thoughts and aspirations of a people than the documents in it. Perhaps if we thought oftener of our public buildings in this light we would make more strenuous efforts to preserve them. Let us endeavor to remember that it is our duty to guard the records the past has intrusted to us, and to hand them on to future generations.

The Value of Health

The fundamental value of health in life and in a program of education is obvious. Big business has discovered that health means wealth, both for itself and its employes. One firm, for example, found that by the introduction of free dental clinics the output from its factories was greater than ever before. The average number of days of labor per man was increased, and the profits for the firm and the wages of the men over a period of a year were larger than ever before. The men were happier and more efficient in every way. The school may profit from these suggestions. The realization of all the worthy aims of education depends primarily on the health of its people. To have healthy children means a happier and more successful school and a finer standard of citizenship.

Dr. J. Mace Andress,
U. S. Bureau of Education.

Methods of Dust Prevention for Maintenance and Preservation of Gravel Roads

By G. C. Dillman
Maintenance Engineer, Michigan State Highway Department

THE subject of dust prevention and maintenance of gravel roads is of vital importance. It is a matter that has too often been loosely handled if not left entirely out when plans and estimates for the year's maintenance program have been made. It would be much better if road officials and engineers would take the initiative in this matter rather than have the issue come about through public opinion. And the public is awake to the situation now. Evidence of this is the widespread interest of business and civic organizations as well as private individuals. Until a few years ago the public was concerned with this subject in cities and villages only, but equal interest now prevails in the country as well. I believe we can hear the public cry, "More dustless roads!" as though it comes from far away, yet if we do not make more of a coöperative and intelligent effort to render our principal gravel roads more nearly dustless when subjected to fast-moving traffic, this cry will be thundered in our ears.

There are many reasons why roads should

AN UNTREATED COUNTRY ROAD—DUSTY AND RUTTED

SAND AND GRAVEL ROAD, HENNEPIN COUNTY, MINN., TREATED WITH THREE HOT APPLICATIONS OF TEXACO LIQUID ASPHALT AT A RATE OF ½-GALLON PER SQUARE YARD EACH, TO BIND THE SURFACE AND ELIMINATE DUST

be kept as nearly dustless as is possible. The enormous quantity of dust annually swept from our lower-type roads proves a nuisance, and is unhealthful not only to people traveling the highways, but to persons, livestock and vegetation adjacent to them. Clouds of dust add an extra element of danger for people using the roads. Material blown or swept from the road itself is lost and must be replaced at a big annual expense. These objections and others that might be mentioned are a menace to the public in general.

Causes of Dust Formation

Dust is matter in a finely divided state. That its connection with the gravel road may be thoroughly understood, we should consider the causes for its being present. These causes, in the order of their importance, are wear, binder or filler in the gravel, and foreign material carried onto the road through several possible agencies.

All forces tending to disintegrate the gravel road produce wear. Chief among these is traffic. The extent to which the road may be destroyed by traffic depends directly upon the nature and the intensity of traffic and the ability of the gravel itself to withstand the abrasive and impact effects. This type of road surfacing is rather susceptible to the action of the elements. The physical effects wrought by frost action and rain falling and washing the filler out of the gravel are common knowledge. The wear occasioned by the action of such forces as named is partially within our control, and we may practically eliminate the dust nuisance by certain methods.

The nature of the binder or filler in the gravel is very often the source of much dust. Wearing surface gravel to be used on roads carrying heavy traffic should contain but a small per cent of clay or sand and no vegetable matter. Herein lies one of the direct causes for some roads being so terribly dusty. Filler of this nature has very little if any wearing qualities and is not a good binder. Then why do we continue the use of such material, actually wasting the money invested in that binder, and contributing on a wholesale scale to the dust nuisance? A legitimate excuse for this, I believe, cannot be given.

The fault of putting on gravel containing a large per cent of poor filler does not lie wholly with the construction forces. In fact, a large part of it is placed as maintenance in the nature of patching and light resurfacing. Such work should be discontinued, and by so doing the problem of dust prevention becomes smaller and offers an aid to the preservation of gravel roads.

Methods of Preventing Dust and Preserving Gravel Roads

There are two general ways in which the dust problem on gravel roads may be solved —by retaining the dust on the road surface, and by preventing its formation. Non-bituminous materials, such as water, calcium chloride, and sulphate liquor, and bituminous materials, such as oils and refined tars, are commonly used with varying results.

The retention of dust upon gravel surfaces is brought about by certain non-bituminous materials or light oils. The results obtained are only temporary; hence the amount that can be economically spent for such treatment is not great. These binders merely hold the dust particles together on the road surface either through capillarity or the presence of a certain binding base.

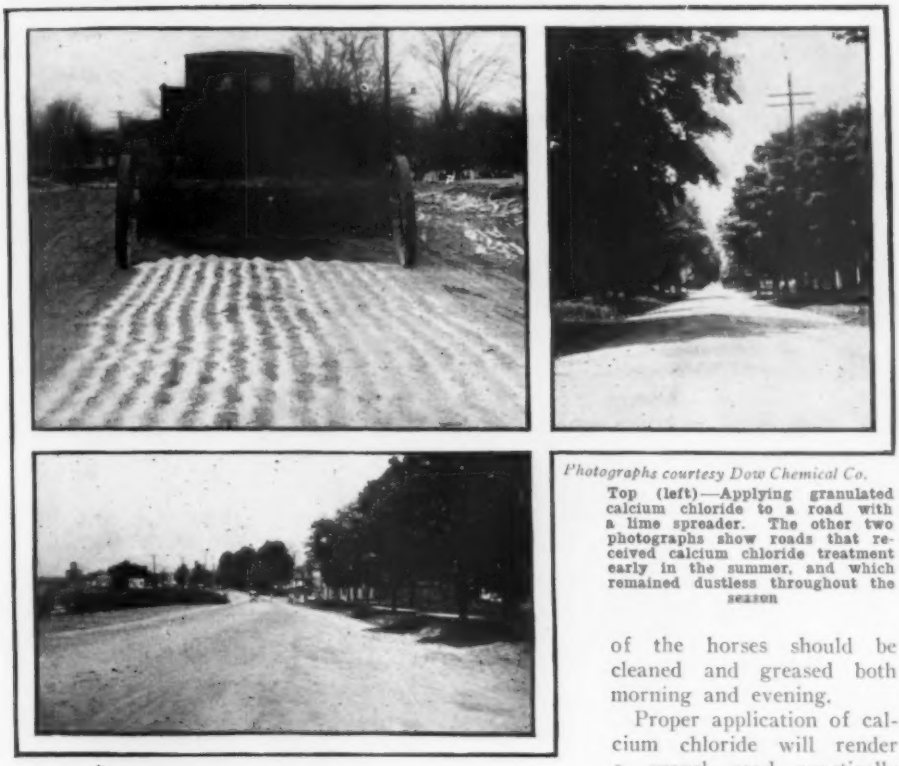
Sprinkling with Water

Water is used in cities as a rule for laying the dust on pavements. Here it may be economical, but this is not the case in the country, where water is not accessible every few hundred feet. Because of its rapid evaporation in dry weather, it necessitates very frequent sprinklings, hence it cannot be seriously considered.

Calcium Chloride

Calcium chloride is coming into quite general use as a dust preventive on gravel roads. It is available in both granular and flake form, which makes it convenient and economical for use. The material when applied to the road absorbs moisture from the air, maintaining the surface in a damp, clean and odorless condition.

It is advisable to use calcium chloride after rains when the surface of a road is in a moist condition. By so doing, better penetration is obtained. For the first application, I would advise not over one pound per square yard of surface treated, subsequent treatments being from one-half to not over three-quarters of a pound. The number of applications each year depends upon the quality of gravel on which the chloride is applied, and the character and volume of



Photographs courtesy Dow Chemical Co.

Top (left)—Applying granulated calcium chloride to a road with a lime spreader. The other two photographs show roads that received calcium chloride treatment early in the summer, and which remained dustless throughout the season

traffic carried. Under moderate traffic, two applications a year are sufficient, while if the traffic is heavy, three may be necessary.

For distributing calcium chloride, a lime drill hauled by a motor truck should be used. The chloride is fed directly from the truck, and when in flake or possibly granular form, the material is free running and distribution is rapid. Let us assume three and one-half tons of chloride carried on a truck, the distributor having a spread of 8 feet. Then on a 16-foot gravel road, the central 4 feet being lapped, this quantity will cover one mile, applying three-fourths pound per square yard on 8 feet of the road, and 1½ pounds on the central 4 feet. This method is more satisfactory than making an even distribution the full width of the gravel, because the chloride will naturally work out.

When handling this material, workmen should be provided with rubber boots, as the chemical action of calcium chloride is very detrimental to leather. In case the distributor is horse-drawn, the hoofs and hocks of the horses should be cleaned and greased both morning and evening.

Proper application of calcium chloride will render a gravel road practically dustless and will do away with ravelling to a large extent. This material aids in maintenance on account of holding the dust particles together, thus conserving road material. Roads may also be dragged during dry weather as well as after rains. The use of calcium chloride does not require less dragging—in fact, there is a tendency for more "chatter bumps" to develop. The continued use of chloride has a cumulative effect, and roads that have been treated will become softer during the fall and spring months than when not treated. Notwithstanding these things, the disadvantages, I believe, are more than outweighed by the good effects.

Sulphite Liquor

Sulphite liquor, which is produced in the manufacture of wood pulp, may be used as a dust preventive and binder for gravel roads. Crude sulphite liquor has little binding value, but when concentrated fair results may be had with its use. The objection to this material is that it is partially soluble in

water, and rains tend to destroy the bond, permitting the gravel to loosen, and holes soon develop.

Light Oils

Under favorable conditions certain light oils may be applied to gravel roads with fairly good results. The oils should be asphaltic in character and will serve as a dust preventive only. Frequent light applications during a dusty season, just enough to lay the dust, are preferred to a single heavy one. Should oil enough be put on the road to penetrate it, the gravel would tend to disintegrate. The first treatment should be given in the spring when the road has dried out thoroughly, the last treatment in the latter part of the summer, so that the oil will disappear by winter, leaving the road in its natural condition. If oil is allowed to get into the gravel and remain over winter, a soft condition is quite sure to follow in the spring.

Heavy Asphaltic Oils and Refined Tars

The use of heavy asphaltic oils and refined tars for surface-treating gravel roads has had considerable attention in recent years. These materials not only serve as dust palliatives, but contribute in a degree to the binding of the road surface. The lack of resistance offered by gravel roads to the trying traffic conditions now being imposed upon them is due to conditions not in the body but in the road surface.

The gravel should be particularly clean and free from clay and other dusty material. It should be as uniform as possible, not containing pockets of sand, and should approach the stability of macadam. The original condition of the road must be good. If the surface does not meet these requirements, the application of heavy asphaltic oils and refined tars is not only so much money wasted, but may result in excessive rolling and a continuity of holes.

Good results from the application of a bitumen will depend largely upon proper selection of the materials and the method of application. Special attention must be paid to detail, for neglect in one thing may mean failure of the treatment.

More consideration should be given the time of the year than has been the rule. Confine this work to the summer months only and make applications during the warmest part of the day. The warmer the day, the greater will be the penetration into the gravel, insuring results more satisfactory and permanent. During such a period the bituminous material will remain in a semi-liquid state longer, enabling it to get a better grip on the gravel with less liability of its peeling or picking off.

The two functions of surface treatments such as we are now considering are, first, a priming or binding action of the upper portion of the gravel, and, second, the sealing over of the surface. The first application of perhaps one-quarter gallon per square yard should serve as a primer only. Sufficient time should be allowed for this to penetrate into the road crust, then follow with the second one-quarter gallon application. A top dressing of clean pea gravel or hard stone chips not exceeding one-half inch in size should then be placed and the whole surface rolled.

There is one bituminous treated gravel road in Michigan that has commanded the respect of a good many people concerned with this subject. The work was under the direct supervision of an engineer who had made a study of the problem. The road was originally built as water-bound macadam, and in 1915, after nine years of service, what remained was shaped up and given a wearing course of gravel. During the following summer the road was given an application of asphaltic road oil, which acted as a primer and dust-layer. Early in 1917 the surface was given a treatment of refined tar, and later an application of a good grade of asphaltic oil. That was three years ago, and since that time the surface has been maintained in good condition by patching.

Bituminous materials should be applied in amounts just sufficient to seal the road, avoiding the possibility of building up a mat or heavy carpet. Additional treatments should be made only when necessary, which may prevent pushing and rolling, with which we are all too familiar.

The success of any bituminous surface treatment depends largely upon the maintenance of a surface smooth and unbroken. If this one thing might be engraved upon the minds of all highway engineers, maintenance superintendents and others connected with the care of surface-treated roads, how different things would be!

Acknowledgment.—From a paper read before the Seventh Annual Conference on Highway Engineering and Highway Transport at the University of Michigan.

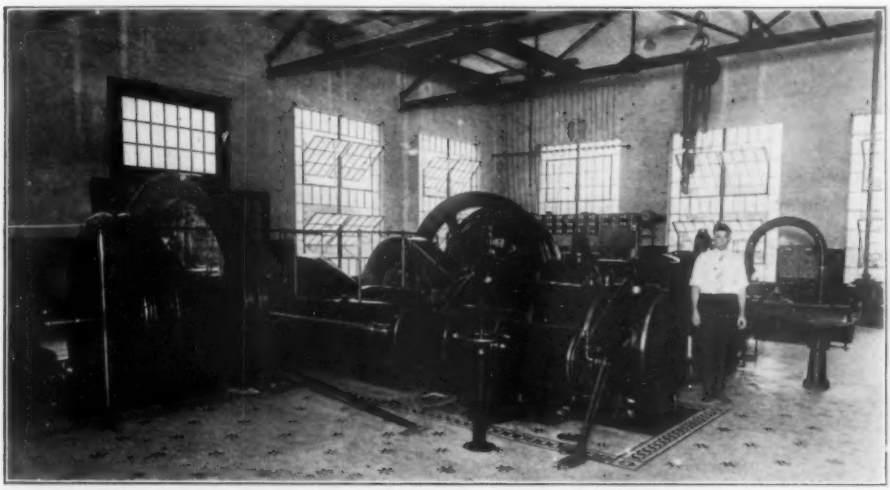
The Growth of the Municipal Electric Plant in Bartow, Florida

By D. E. Bivins
Superintendent, Public Utilities

IN 1904 Bartow, Fla., had a population of about 1,800 and the municipality had only recently purchased from private parties the electric lighting plant, consisting of a frame, iron-clad building 30 by 60 feet, containing a 75-kilowatt generator belted to a small slide-valve, throttling type of engine. The steam generating equipment consisted of one Atlas fire tube boiler of 100 horse-power at 125 pounds pressure. Lighting service was furnished from sundown until daylight only, with frequent interruptions. Realizing the futility of satisfactory service with such equipment, it was decided to junk it and install more reliable and modern apparatus. A 125-kilowatt Bullock generator direct-connected to a 15 by 16 Skinner automatic engine and a 150-horse-power fire tube boiler, working pressure 150 pounds, were purchased and installed.

The town had been operating the waterworks plant for some time, pumping water by a gasoline-engine-driven pump. A steam pump was purchased and water was pumped by steam at the electric plant.

During the year 1910 it was decided to institute a 24-hour electrical service as a convenience to the public. There being no manufacturing industries here, the most optimistic could scarcely conceive a motor load worthy of the name. Stock raising, fruit and vegetable growing, and lumbering were the occupations engaged in and the principal source of wealth in the community. The gross receipts of the combined water and light plant were about $600 per month.



INTERIOR OF THE MUNICIPAL POWER PLANT, BARTOW, FLA., SHOWING THE NORDBERG UNIFLOW ENGINE

The peak lighting load at that time reached a maximum of 85 kilowatts at 8 o'clock P. M., falling to approximately 10 kilowatts, or to street lighting load only, at 11:30 P. M., continuing constant until daylight, at which time the plant was closed down. This extremely light load over a period of several hours' operation by a unit of this size had the effect of materially increasing the fuel consumption per kilowatt in excess of the results secured during the heavier, or peak, load. There being no load that could be secured during these hours, the logical method of correcting this condi-

tion and making it possible to furnish continuous service was to install a smaller unit to take the load at 10 or 11 P. M., or at such time as the load came within its range, thereby saving at least half the wear on the larger and more expensive unit, economizing in fuel and making it possible to operate the small unit throughout the day with little or no additional fuel.

A 50-kilowatt generator direct-connected to a 10 x 10 American-Ball automatic steam engine was installed for this purpose and the real growth of the plant began from this date. A smoothing-iron, fan and small motor canvass was started, and in 1914 a larger plant became necessary to take care of the increasing load. We had now reached the stage of a permanent power plant, and the type of building and engines best suited for our conditions were thoroughly investigated. The merits of the Diesel type of oil engines were given careful consideration and, viewed from the point of fuel economy alone, appeared to have superior merit. It was necessary, however, to consider the requirements of the water-works department, especially the fire pumps, which would require motors of large capacity, seldom used, but possibly needed on peak lighting load, necessitating engines and generators of abnormal size and cost, and this excess capacity always maintained, to operate them. A combined steam water-works and an oil engine electric plant was not to be considered.

The high efficiency which may be secured on both light and heavy loads made the poppet valve uniflow steam engine appear ideal for our requirements. This type of engine was decided upon, and subsequent results confirmed the wisdom of its selection. A strictly fire-proof building was constructed of vitrified brick, with reinforced concrete roof, and floor laid with mosaic tile. A reinforced concrete stack was built, and water tube boiler, condensing apparatus, and motor-driven water-works service and steam-driven fire pumps installed. To our electrical equipment were added a 200-kilowatt generator direct-connected to a 400-horse-power Nordberg uniflow poppet valve engine, a 10-kilowatt motor-driven exciter, and a 10-panel marble switchboard with remote-control switching gear, voltage regulator, etc. The plans and specifications were drawn by E. V. Camp, C. E., of Atlanta.

After the installation of this equipment it was highly desirable that a larger daylight load be secured in order to operate at maximum efficiency. The only prospective load at this time consisted in supplanting with motors the gasoline engines that were driving irrigating pumps on the irrigated vegetable farms located a mile or more beyond the city limits. This was not a very desirable load on account of its intermittent, uncertain and seasonal character; it was decided, however, to try to take on this load, which aggregated about 100 horsepower. A rate of 4 cents per kilowatt was offered and the business secured, and the demand for power for this purpose developed very rapidly. Other industries began to materialize and, attracted by the rate offered, were connected to our lines, and our load curve began to straighten in an encouraging manner.

During the year 1917 it became necessary to again increase the capacity of the plant. A 400-kilowatt generator direct-connected to a 600-horse-power Nordberg uniflow, poppet valve engine, a 25-kilowatt, synchronous motor-driven exciter, and new condensing equipment were installed. The Bayer counter-flow, barometric type of condenser was secured, giving a vacuum of 28 inches, with a low minimum of cooling water. The 125-kilowatt Bullock generator and Skinner engine were removed and sold for three-fourths of their original cost. With the new equipment, the cost to produce a kilowatt at the switchboard was 1.73 cents. Our off-peak power rates covering motors of 5 horse-power and larger at this time was based on a sliding scale of 4, 3, 2.5 cents per kilowatt, with a minimum of 50 cents per month per horse-power of connected load. Our lighting rate was 10 cents per kilowatt, with a monthly minimum of $1.50.

In 1920 the fuel and labor conditions became so acute that we were forced to the use of oil for fuel, which with the increase in employes' salaries almost doubled the cost of production. Some of the above-mentioned improvements and expensive line extensions having been made without a bond issue but financed by local banks and expected to be rapidly liquidated by the earnings of the plant, it was decided, effective October 1, to advance our lighting rate to 12½ cents per kilowatt, and power rate to 6, 5, 4 cents per kilowatt, with a mini-

mum of $1 per month per horse-power of connected load. This rate was still lower than that offered in towns of similar and larger size in this part of the state.

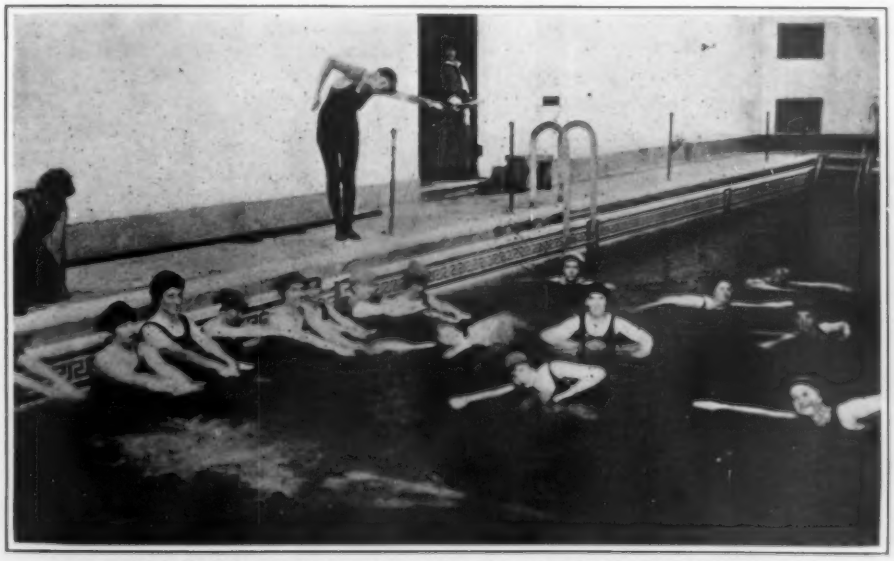
To-day Bartow has a population of 4,800. The electric plant has a capacity of 650 kilowatts, 725 light and power customers, a connected motor load of over 600 horse-power, not taking into account motors smaller than 5 horse-power, and gross earnings closely approximating $6,000 per month, or over $1.25 per capita per month. Our power customers now include a fertilizer plant of 125 horse-power, irrigating plants totaling over 325 horse-power, motors for silo cutting, milking machines, printing plants, axe-handle factory, medicine manufactory, several garages and vulcanizing plants, dough-mixers in bakeries, elevators, bottling works, orange packing-houses, etc., and innumerable small motors operating sausage grinders, coffee-mills, exhaust fans, forge blowers, shoe shops, etc. Since the first of the present year our motor load has averaged above 225 kilowatts from 7 A. M. to 6 P. M., with a minimum of 150 and a maximum of over 400 kilowatts. Our lighting peak load reaches a maximum of 275 kilowatts.

Our fiscal year ends May 31, and in submitting a synopsis of the auditor's report of 1920, covering the operation of the electric plant, it is only proper to state that for current used for municipal purposes, as street lighting, City Hall, Library, etc., a nominal charge is made, covering only cost of producing current and lamp renewals.

STATEMENT OF EARNINGS AND EXPENSES
ELECTRIC LIGHT DEPARTMENT
MAY 31, 1920

	Dr.	Cr.
Earnings, Light Department:		
Sale of current to consumers..		$28,219.62
Current for street lighting....		3,237.00
Current for Library and City Hall		48.00
		$31,504.62
Expenses, Maintenance and Operation:		
Salaries	5,527.92	
Fuel	6,981.62	
Supplies	973.83	
Interest and expenses.....	500.14	
Repairs and renewals.....	151.73	$14,135.24
Gain from operation.....		$17,369.38
Bond interest	2,075.96	
Sinking fund	1,422.24	
Outstanding indebtedness	1,761.08	
Extension of lines.....	7,503.22	12,762.50
Net gain from Light Department		$ 4,606.88

Many Cities Have Municipal Swimming Pools



WHAT IS YOUR CITY DOING TO PROVIDE PUBLIC BATHING FACILITIES?

The Public Health Nurse

"When and wherever there is life to be tended, nourished or nursed, educated or saved; whether the life be yet unborn or new born, senile or ill, there is the field for womanhood exercising its great function of foster motherhood."—Salleeby, "Surgery and Society."

THE public health nurse is now often spoken of as "The Foster Mother of the Race." Whether she specializes in school nursing, industrial nursing, prenatal and maternity care, infant and child welfare, the care of the tuberculous, venereal disease control, mental hygiene, medical social service, or whether she tries to combine these functions in generalized nursing, she is known and accepted as a friend of the people. For the past twenty years her blue uniform has been a familiar one in the city streets, particularly in the poorer districts where bedside nursing is very necessary. Within the last decade she has been included in plans for civic betterment in small towns and rural districts, and she is no longer thought of as a charity nurse.

The educational work she does in preventing illness is now accepted as a very important service to any community. City health departments, county boards of commissioners, state departments of health, are now employing public health nurses in large numbers, following in the lead of private agencies, visiting nurse associations, women's clubs, etc., which first proved that public health nurses are necessary to community health.

Many states now have laws providing for the employment of public health nurses in towns and counties, and where there are no such regulations, the nurses are often employed as teachers of hygiene. All city health departments have their divisions of public health nurses who render assistance in preventing the spread of communicable disease, watching over the school children, making visits to the homes, locating and following up suspected cases, helping to maintain quarantine, advising parents concerning the care of their sick, and teaching the methods of maintaining health.

At many of the state capitals, the board of health has a division of public health nursing with a nurse director in charge whose duty it is to supervise and direct all public health nursing within the state. She standardizes the work of the nurses in the field, though they may be employed by various private associations. She conducts individual group and state conferences, advising the nurses concerning the plans for work, the necessity for adequate records, proper uniforms, etc.

She coöperates with Red Cross chapters, tuberculosis societies, visiting nurse associations, women's clubs, boards of education, etc., wherever they are financing work of this kind. Many times these agencies demonstrate the value of public health nursing for a year or two, after which it is taken over by the municipal or county government. This is the aim of practically all private societies, but particularly the American Red Cross, which is at present financing, through its county chapters, thousands of rural nurses scattered over the United States. These nurses, like those employed by county governments, are furnished with automobiles, and they are often the only health workers in the county.

THE PUBLIC HEALTH NURSE IN THE SCHOOL

There is no division of public health nursing in

our National Government, but there is a Children's Bureau in the Department of Labor. The surveys made and published by this bureau show the need and value of public health nursing in reducing deaths and disease among women and children.

The Metropolitan Life Insurance Company has extended visiting nursing to its industrial policy-holders since 1911. Dr. Lee K. Frankel, in charge of the Welfare Division, has recently issued the following statistics showing the saving of lives through this service in eleven years:

A PUBLIC HEALTH NURSE TEACHING A YOUNG MOTHER HOW TO CARE FOR HER BABY

> "Thirty-eight thousand fewer deaths among Metropolitan industrial policy-holders in the United States and Canada during 1920 than if 1911 death-rate had prevailed.
>
> "A decline of 23 per cent in the mortality rate since 1911; 9 per cent reduction between 1919 and 1920.
>
> "Tuberculosis mortality 40 per cent, typhoid fever 72 per cent, acute infectious diseases of children 28 per cent, heart disease 19 per cent, accidents 26 per cent less in 1920 than 1911. In each instance a more rapidly declining mortality rate than in the general population.
>
> "This saving of lives was accomplished by community health work, by the company's coöperation with health authorities, by visiting nursing to more than 2,000,000 cases of illness in eleven years, by distribution of over 215,000,000 pieces of health literature, and by education of policy-holders in hygiene through its agency staff."

Dr. L. Emmet Holt in the *Medical Record* for May 1, 1920, says:

> "At present and for a long time to come most sick people must be treated in their homes. Even if it were desirable, it is simply impossible for any city or community to provide enough hospital beds to supply the need. It has been estimated that fully 90 per cent of sick people are treated in their homes, as against 10 per cent treated in hospitals. The possibility of taking care of very sick patients with only part-time service of a trained nurse is not yet generally appreciated either by the medical profession or the public. With the present shortage of nurses and the expense involved in the full time of one, or possibly of two nurses, the service of the part-time visiting nurse would seem now the best solution of the problem rather than to seek to provide for patients in hospitals."

There are at present about 10,000 public health nurses in the United States. According to Dr. C. E. A. Winslow of Yale University, at least 50,000 are needed to adequately carry out the program of preventive and curative work so much needed in America to-day. Foreign countries are looking to the United States for direction in organizing public health nursing as an important part in the post-war reconstruction work.

The National Organization for Public Health Nursing, 156 Fifth Avenue, New York City, organized in 1912, has been a valuable aid in promoting and improving public health nursing. Through its members, professional and non-professional, its magazine, *The Public Health Nurse*, its committee on education of public health nurses, its library service, its biennial meetings, its secretaries who act as advisors in all matters pertaining to organization and administration of public health nursing, the organization has been able to assist very materially in keeping up certain standards and principles pertaining to public health nursing.

It is now generally admitted that a graduate registered nurse who has had no prepa-

ration in the theory and practice of public health nursing should not be employed—except perhaps, on large city affairs where she may have the very closest direction and supervision.

There are eighteen schools in the United States where nurses receive this special preparation for public health nursing. They are connected wtih state universities. Through the efforts of graduates of these schools "An Equal Chance for Equal Health" is possible for many.

The human side of the nurse's work is shown in the following extracts of nurses' reports:

"After a rather bad struggle, a visiting nurse was successful in helping a young girl back from a very serious attack of pneumonia. The father, a man over thirty, had not seemed unduly alarmed even when his young daughter was worst, because, as he afterward explained, 'I knew you could do it; from the first minute I laid eyes on you coming in that door, I knew it was all right with Mary. You see, more than twenty years ago, when I was only a kid and my mother was dying with the same thing, a girl like you, with a blue coat, came in. Ma had no chance, they said, but if you want to hear her tell about it, she is only two blocks away down the street. I have never seen the blue coat from that day to this, but as soon as I saw it, I knew that Mary was safe.'"

"School work has kept me very busy this past month, as we have had a smallpox epidemic. During the height of the epidemic more than sixty families had it. In one family the father and six children were ill, and to make matters worse, the mother gave birth to a baby boy. I urged vaccination last fall, but it took a little time before the School Board passed on it. We kept the school open—in fact, in a small town where people think less of having smallpox than of being vaccinated, it was really the safest thing, but it was work to discover all of the cases. During the height of the epidemic the City Council wanted me to investigate all suspected cases in the homes, and a machine was placed at my disposal. The mornings were spent in the schools, and in the afternoons visits were made all over town and sometimes four miles out in the country. In one place three miles out, a school child had every evidence of smallpox, the mother had thought nothing about it and had called no physician. She told me she was going to town that afternoon to visit her sister, just operated upon at one of the hospitals. Needless to say, she did not go. Rich and poor were affected alike and quarantine signs were all over town."

Connecticut Advertises Its Motor Traffic Laws

STATE OF CONNECTICUT
DEPARTMENT OF MOTOR VEHICLES AND STATE HIGHWAY COMMISSIONER
OFFICIAL WARNING!!
ARRESTS WILL BE MADE FOR VIOLATIONS OF THE ABOVE
For Information Address Commissioner of Motor Vehicles, State Capitol, Hartford

TYPE OF SIGN PLACED ON ROADS ENTERING CONNECTICUT, GIVING AN ABSTRACT OF THE STATE TRAFFIC LAW

The Use of the Police Signal System in the Protection of Salt Lake City's Water-Supply

Salt Lake City Water-Supply Patrols Use Signal Boxes Effectively

By Charles J. Reading

Superintendent, Fire and Police Alarm System, Salt Lake City, Utah

INSTALLATION of the police signal system in the canyons from which Salt Lake City's water-supply is drawn has proved invaluable to the city. During the late war, when the sources of the water-supply were carefully guarded, this system enabled patrolmen in the canyons to keep in close touch with the city's police department and thus guard against any possible crisis.

The City's Water Sources

The water-supply for the city of Salt Lake is obtained from near-by canyons—City Creek, Emigration Creek, Parley's Creek and Cottonwood Creek. All these sources being far above the city, the water is distributed by gravity through the city mains from the high line in City Creek Canyon, the reservoirs at Thirteenth and Fifteenth East Streets, and from the intake in Parley's Canyon. About 25 miles east of the city are the Cottonwood Lakes. These have been converted into natural reservoirs and

CAPITOL HILL RESERVOIR, SALT LAKE CITY, SHOWING STATE CAPITOL BUILDING IN THE CENTER, AND CARETAKER'S RESIDENCE, WITH POLICE SIGNAL BOX AT RIGHT

Only a few months ago the caretaker at the Twentieth Ward tank in City Creek Canyon was taken violently ill in the night. He immediately notified the operator at the central police desk. Before the conversation was finished the caretaker fell unconscious. Other members of the department were rushed to the scene and the man was found in a dying condition. If the police signal system had not been installed, that branch of the water-supply would have been unprotected the remainder of the night, and the caretaker would have been found dead in the morning.

furnish their quota of the water used. The dam in Parley's Canyon will be enlarged soon by building the second unit of 40 feet.

During the year 1920 the Parley's high line conduit and the Sunnyside pressure line were completed, and these increased the capacity of the supply lines to the city by approximately 40,000,000 gallons per day. The city had been in need of this improvement for a great many years, as the capacity of the conduit from the Parley's and Big Cottonwood sources was not sufficient to supply the demands or to carry the necessary water even when it was available. The supply of water from these sources had heretofore been limited to the amount that could be carried in the old Parley's conduit, which was built in 1888 with a carrying capacity of only 17,000,000 gallons per day, and the Twenty-seventh South supply line with a capacity of 12,000,000 gallons per day.

The new Parley's high line conduit connects on the Big Cottonwood conduit on the south side of Parley's Canyon, and syphons across the canyon, carrying the supply to a point near the mouth of Emigration Canyon. From this point it is delivered through a 30-inch cast iron pipe to distribution reservoirs at Thirteenth East Street and Fifteenth East Street.

At each of the reservoirs and intakes, with the exception of the Cottonwood Lakes, the water-works department has tank men on duty at all times. It is now planned to place three shifts of men on duty at the lakes in the near future.

Policemen patrol the canyons, from which the water-supply is drawn, at all times. It is their duty to keep campers at safe distance from the streams and to guard against the pollution of the water by horses, cattle and sheep. In the summer, when the canyons are full of pleasure-seekers, this requires careful attention to duty, and the patrolmen must be able to establish quick communication with the head office of the water-works department.

The Lines of Communication

To make such quick communication possible, police boxes have been placed at all reservoirs and intakes. These are connected with the main fire and police alarm office, then through a relay to a recording set in the office of the superintendent of water-works. This set registers the box number and stamps the time of registration. The boxes have a complete telephone set, so that conversation between the superintendent's office and any station may be carried on at any time. All tank men and patrolmen are required to report in each hour and they may be called by a bell rung from the central office.

On the central police desk at the main office there are three direct lines: one to the office of the superintendent of water-works; one to the shop of the water-works department; and one to the emergency station, where men are on duty at all times. All the work of the system is carried on over these lines. This enables the superintendent of water-works to direct the operation of the entire system through these lines and the police boxes, giving him control of all employes at all times. The system has proved such a success that it is the intention of the Commissioner of Water-Works, C. Clarence Neslen, who is also Mayor of the city, to extend these lines of communication to the Cottonwood Lakes during the present year. If this is done, it will mean the placing of ten more police boxes on that line of the system.

This system of communication for the water-works department was made possible when the City Commissioners installed the Gamewell Company Type B police desk at the fire and police alarm office. Its operation by regular employes of the alarm system enables the city to maintain the water-works branch at a nominal cost.

The entire system comprises: the central desk; the recording set in the superintendent's office; 20 miles of line constructed of No. 12 galvanized iron wire; four miles of underground cable; and eleven police boxes. The recording set in the superintendent's office consists of one Ideal punch register, one Gamewell time stamp, and one take-up reel. Taking into consideration the service that has already been derived from this system in increasing the efficiency with which the work of the department is handled, it can readily be seen that it will pay for itself in a very short time.

Besides enabling the superintendent of the water-works department to keep track of the activities of the men in his employ, the signal system makes it possible for the caretaker at the Capitol Hill reservoir, a picture of which accompanies this article, to call from his residence and regulate the volume of water supplied to the city water sys-

tem from the branch under his control. This is also true of the other caretakers. Formerly they were obliged to make their reports and issue their orders in person, thus losing much valuable time.

A Quick Call and a Quick Response

Most of the reservoirs and conduits are located in the heart of the rugged mountains, several miles from the city. Before the signal system was installed, the patrolmen in these mountains and canyons had no way of calling assistance to their aid if anything should go wrong. If they were obliged to make any arrests in the performance of their duties, they had to handle their prisoners alone in the best manner possible. Under the present system, they have merely to notify the operator on the central desk at police headquarters and a patrol wagon load of officers is rushed to their assistance.

The system has proved invaluable also in guarding against grass and forest fires in the summer time. Whether Salt Lake City's water-supply is high or low in the summer depends to a great extent on the amount of snow stored in the hills in the winter. A heavy growth of grass and underbrush tends to hold the snow and prevent it from blowing off the hills or melting so rapidly that it simply runs off in a torrent and fails to soak into the ground. These growths of grass and brush cover the watersheds, and great care is taken in the dry months of summer to prevent them from being destroyed by fire.

Since the installation of the police signal system, the work of protection has been much easier than it was before. Prior to that time, patrolmen in the canyons, upon discovering a fire, were obliged to ride to the nearest telephone, perhaps a couple of miles away, and notify the superintendent of water-works of the impending danger. At present the patrolmen simply go to the police box, and the notification is practically instantaneous. In a few minutes a large number of men from other points of the system are on the way to fight the fire which is menacing the watersheds. In this way the signal system has been instrumental in avoiding much harm to the watersheds.

An interesting Indian legend has been woven about "Suicide Rock," shown in the cover design for this issue of THE AMERICAN CITY. Years ago, so the legend says, a beautiful Indian maiden whose brave had been killed in one of the many fierce wars waged in this vicinity, used to wander daily to this rock and use it as a lookout station, from which she would scan the surrounding country for sight of her loved one. Day after day she repaired to this rock, refusing to believe that her warrior had met his death. Finally coming to a realization of the truth, she threw herself from this ledge and was dashed to death on the rocks below.

A Toast to Water

A Southern colonel at a banquet in Arkansas offered the following toast to "water."

"Water—the purest and best of all things that God created. I want to say to you that I have seen it glisten in tiny teardrops on the sleeping lids of infants. I have seen it trickle down the blushing cheeks of youth, and go in rushing torrents down the wrinkled cheeks of age. I have seen it in tiny dewdrops like polished diamonds when the morning sun burst in resplendent glory o'er the eastern hills. I have seen it in the rushing stream rippling over pebbly bottoms; in the river rushing over precipitous falls to join the mighty Father of Waters, and I have seen it in the mighty ocean on whose broad bosom float the battle fleets of all nations and the commerce of the world—but, ladies and gentlemen, I want to say to you now, that as a beverage it's a damned failure."

We, too, have seen it on the mighty ocean shores choked with garbage, rubbish and decayed fruits, a menace to the health of bathers and the men who man the ships of commerce and of war. We have seen it in the mighty Father of Waters supporting bodies of dead animals, raw sewage and other filth. We have seen it in the placid river and in the roaring falls, carrying camp refuse, decayed vegetation, tin cans, papers and spoiled food. We have seen it in the trickling springs where lowly cattle cool their feet and in still pools where mosquitoes come to life. We, too, have seen it on the weary lids of sick children, fevered youths and old folks, on their noses and their mouths, and we want to say now and here that—you are right, colonel; as a beverage it is a damned failure—unless you know it's pure.—*California Health Bulletin.*

Conditions Under Which Guard-Rails Should Be Used on Highways

By William W. Cox
Engineer-Manager, St. Clair County, Mich.

SINCE the advent of the automobile as a means of transportation, and since the more recent development of the motor truck as a means of hauling freight, many new problems have confronted road builders. As the volume, weight and speed of traffic increase, the road builder must increase his efforts to meet those conditions, so that the maximum service may be obtained in the use of our highways.

New and revised laws are enacted to regulate speed and weight, new and more rapid means of construction are adopted to facilitate the completion of roads, stronger foundations and better surfaces are designed and constructed, new alignments are being made, all for the purpose of improving our highways.

Notwithstanding the advances in legislation, design, and construction, have not road builders overlooked the necessity of providing proper safeguards for the protection of life and property? Has the subject of safety been studied sufficiently so that under certain conditions we make guard-rails an important part of our construction requirements?

It is conceded by the writer that the use of guard-rails will not entirely solve the problem of protection, but it is well to examine the conditions under which they can be used to advantage.

Where Accidents Are Likely to Occur

On roads where the hard surface or traveled way is narrow, say 9 feet wide, and the grade is 20 to 24 feet wide, where the shoulders or berms are of light sand and soil, or where they are of heavy clay, many accidents are sure to result by skidding when vehicles pass. Especially is this the case with fast-moving and heavy vehicles. This skidding and upsetting in the ditch may be attributed to the carelessness of the driver, but—have you ever driven a speedy automobile or a heavy-loaded truck on soft or slippery shoulders? If you have, you will agree that even though

AN UNUSUAL TYPE OF GUARD-RAIL OF HEAVY TIMBER AND WIRE ROPE

average care and judgment are used, accidents are sure to occur where narrow surfaces and poor shoulders exist. These accidents may be more or less expensive, even if not fatal. Fatal accidents usually result when the ditches are deep or when the fills are high. As a general rule, it is considered advisable to use guard-rails where the ditches are over 4 feet deep and where the fills are over 4 feet high.

On roads where the traveled track or hard surface is 16 feet wide and the grade is 24 to 30 feet wide, accidents are not numerous unless the surface is rough and the traffic is congested. As traffic increases, we find that the number of accidents increase proportionally.

On roads where the traveled track or hard surface is wide enough to accommodate traffic, so that vehicles may pass freely and without getting off the surface to do so, the danger of skidding to the ditch is elimi-

nated. This holds true except when rain, snow or ice literally greases the skids.

All roads, by virtue of their traffic conditions and of the difficulties encountered in their design and construction, have their danger points and death-traps, where protection should be provided.

Points Where Protection Is Needed

The most common of these is found in flat clay sections where deep drains become imperative for the improvement of the road and the adjacent farm lands. These ditches vary in depth from 3 to 12 feet and very often follow along the road for miles. In these sections we find the customary township line offsets where existing drain improvements prohibit new locations. Where intersecting roads or right-angle turns must remain near these ditches, it is necessary to protect the corners or turns.

In the rolling or hilly sections high fills must be made in order to reduce the grades. These fills, either of sand or clay, are subject to washouts and settling, thus becoming dangerous when over a few feet high unless they are made exceptionally wide. Even the wide grade is treacherous if it is located on a steep gradient. In hilly territory we also find the majority of curves which cannot well be eliminated. These curves may be connected with long or short tangents. They may be long, easy curves, or they may be short and sharp. Where possible, they should be superelevated and widened within reasonable limits. Whether they are long and easy, or short, and whether they are connected with long or with short tangents, they are the most hazardous when they occur on a steep gradient. Without question, curves in hilly territories should be guard-railed properly. But why do we place danger signs if we also advocate guard-rails? We place danger signs as a warning, and guard-rails as a guide for the stranger and as an added safeguard even though curves are wide and easy.

Approaches to bridges and culverts should also be protected. More especially is this true when the roadway is narrowed in these structures or when high waters are likely to disturb the hills.

Guard-rails should always be used when a question of safety is involved, and when used they should be made strong and substantial. They may be constructed of rock in places where proper rock is obtainable to make a good, strong, pleasing rock wall. Reinforced concrete may be pre-cast and assembled into one firm, strong, pleasing structure.

A STURDY SET OF GUARD-RAILS AT A BAD CURVE IN THE ROAD

The guard-rails which are most common in Michigan are constructed of timber. They should be built of 8-inch cedar posts placed not more than 8 feet apart. The posts should be in the ground not less than 3 feet, or deeper in loose soils. They should be placed not at the outer edge of the berm or shoulder, but within it, and at least one foot from the beginning of the side slope. The side-rails, usually three in number,

should be of good, clear lumber, not less than 2 inches thick and 8 inches wide. These should be thoroughly spiked and lag-screwed to the posts. The lower rails should be on center a distance of 15 inches from the ground. The top rail should be placed on top of the post so as to show up well, to strengthen the structure, and to protect the top of the post from decay. The height of the structure should be not less than 3 nor more than 4 feet. The whole should be painted with a good grade of white lead oil paint.

When Guard-Rails May Be Omitted

Perhaps you have been designing and constructing your roads, bridges and culverts so as to eliminate the guard-rail wherever possible. It may be well to consider also how this may be safely done.

Where there are deep ditches and sharp turns, it is found better in many instances to purchase additional rights-of-way. The roads can then be built with wider grades and at a safe distance from the ditches.

At the present price of guard-rail, one mile would cost five or six thousand dollars for one side of the road. This sum would in many cases pay for the rights-of-way and also provide for the wider grade. Usually culverts can be made the full width of the grade with moneys which would be put in guard-rails.

After eliminating them wherever it is possible to do so economically, there still remain places that should be guard-railed. If road builders consider their responsibilities seriously, they should give to the public every reasonable means of protection; whenever accidents occur on highways, they should be able to feel that they are not guilty of negligence. The traveling public, as well as the public at large, are looking to them not only to build roads but also to make all roads safe under reasonable conditions.

Acknowledgment:—From a paper read before the Seventh Annual Conference on Highway Engineering and Highway Transport, at the University of Michigan.

The Prevention of Fly-Breeding

In the Panama Canal Zone, in spite of its all-the-year warmth, there is often not even one fly in a house. The scarcity of flies in the Canal Zone is the subject of frequent comment on the part of visitors.

The methods of getting rid of flies are based on the fundamental principle and practice of preventing their breeding. Streets and grounds are kept clean. Garbage cans are kept covered, garbage is collected daily, and the cans are cleaned with larvacide. In the stables manure is gathered quickly and dumped into compost pits, where heat and the chemical action of fermentation render the manure unsuitable for breeding. There are no old-fashioned privies in the towns, and in the field work, field closets are placed over deep pits, frequently treated with crude oil and larvacide. "Swatting the fly" is practiced through fly-paper and traps; but the fundamental idea is prevention at the source. Such are the basic practices to prevent fly-breeding. They are possible only in a well-organized community, and at the price of continuous effort.

The detail to which this work must go is illustrated by this report, sent in by the district sanitary inspector at Balboa under date of March 10, 1921:

We have always had more or less flies at Balboa restaurant; our reports usually show "few," "very few," "decreasing," or "increasing." From time to time we find small breeding-places, but have never felt satisfied that the real breeding-places had been found until yesterday, when breeding was found in the inner parts of about 12 old grease-soaked corn brooms used for sweeping the floors, platform, and street at Balboa restaurant. In some of these brooms as many as 200 maggots were found, some puparia being found higher up in the dry parts. This has been reported to the chief steward, who will see that the brooms are steamed hereafter to prevent further breeding.

The importance of the prevention of flies lies not only in the removal of a pest, but also in greatly diminishing the danger of infection with typhoid fever, dysentery, and other diseases. In keeping down the number of flies, as in the anti-mosquito and anti-rat work (which are aimed primarily at the prevention of yellow fever and malaria, and of bubonic plague, respectively) the Health Department counts on the intelligent and loyal coöperation of the residents of the Canal Zone. Especially in the work against flies and rats, cleanliness about the quarters is essential.

—*Panama Canal Record.*

Modern Methods of Water-Supply and Purification—Part I

By M. F. Sanborn
Sanitary Engineer, M. Am. Soc. C. E.

EDITORIAL NOTE:—*The happiness, growth and prosperity of a community, village or city depend, more than on any other thing, on the purity, character and quantity of the water furnished by the public water-supply.*

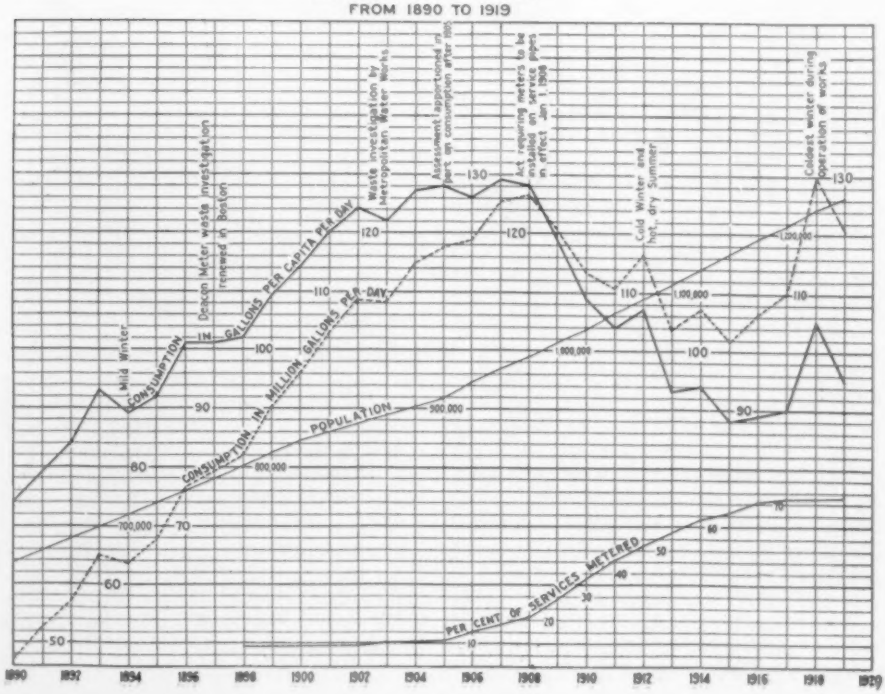
THE uses of water in a city are many—the domestic uses, including drinking, cooking, washing and laundry, fire protection, industrial, and various public uses, such as street cleaning, sewer flushing, fountains and lawn sprinkling.

For domestic purposes the purity of the water is of the utmost importance. It is assured in some cases by using sources free from pollution or possible pollution, but generally by some form of filtration or disinfection, or both. The water should also be as free as possible from color and turbidity, and be moderately soft, especially for washing and laundry purposes.

For fire protection the prime requisites are quantity and pressure. The first is obtained by having mains of sufficient size, a proper number of hydrants, and a reserve supply such as is provided by natural or artificial reservoirs; the second—pressure—is obtained from reservoirs, by pumps or by fire engines, or by a combination of these.

Some industries need a water of certain characteristics, and must employ special treatment to obtain it, but practically all in-

POPULATION, CONSUMPTION OF WATER AND PER CENT OF SERVICES METERED IN THE METROPOLITAN WATER DISTRICT AS SUPPLIED IN 1919 FROM 1890 TO 1919



dustries require a water nearly free from color, turbidity, hardness, and any salts or acids which form boiler scale or cause foaming or pitting of boiler tubes.

The water used for other public purposes than drinking does not need to be of such high standards as given above, especially when used for street flushing, sewer flushing, etc., although it is customary to supply for such purposes the same water that is supplied for domestic use.

Dual Water-Supplies

Dual supplies drawn from two or more sources and used for different purposes, while never desirable, are sometimes necessary. The following are some of the combinations found: very hard water from public supply and rain water collected at various houses for washing and laundry; a satisfactory public supply, and a separate or partially separate supply, generally from a polluted source, for fire protection. Sometimes polluted water is used for fire protection, flushing toilets, etc., and well water for domestic purposes. In some cases cross-connections are found, and serious epidemics have occurred due to the polluted water entering the distributing mains of the regular supply.

Consumption of Water

The amount of water used daily, which for comparative purposes is generally expressed as consumption in gallons per capita per day, varies greatly and will range from a minimum of about 15 to a maximum of 300 gallons or more. This variation is due to many causes, such as age of distribution system, care in detecting leakage and waste, temperature (extreme cold in winter and heat in summer), metering of individual supplies, industrial uses, public uses, and wastage of water by householders or industries.

In a community where all supplies are metered, the metered consumption at different places varies from about 15 gallons to 50 gallons per capita per day, while the unmetered consumption, or that portion of water unaccounted for, varies from 30 to 200 per cent of the metered consumption. The effect of the reduction of consumption per capita per day due to the use of meters may be graphically seen on the diagram showing the consumption and per cent of services metered for the Metropolitan Water District of Boston, which includes Boston and surrounding cities from 1890 to 1919. This diagram shows a reduction in the consumption per capita per day from about 129 gallons during the years 1904 to 1908 to slightly over 90 gallons during the last seven years, when about 70 per cent of the services were metered. This reduction in the consumption is a common experience where meters are installed, and with a complete meter service the reduction will be much greater. The amounts used for public purposes such as fire fighting, flushing of streets and sewers, fountains, etc., while at times considerable, will not average more than from 2 to 10 gallons per capita per day.

The Distribution System

The pressure should be between 45 and 100 pounds per square inch, and preferably from 60 to 80 pounds. A pressure lower than 45 pounds is not suitable for fire protection, and one greater than 100 pounds causes considerable leakage in mains and fixtures and necessitates more costly, heavier plumbing.

The pipes of the distribution system should be of sufficient size for the ordinary needs of the community, for fire protection, for probable future extensions, and in no case less than 8 inches in diameter where a hydrant is to be installed. A maximum short-time consumption of about three times the average consumption should be allowed for.

Two- and sometimes three-way fire hydrants are generally placed at street intersections, and in long blocks they are placed between street intersections. A fire hose 450 to 500 feet is considered the maximum length for effective work.

Sources of Supply

Water for public supply is obtained from rivers or brooks, lakes, springs, shallow and deep wells, and infiltration galleries, and in addition is frequently filtered or disinfected, or both.

Where the flow in a river is at all times greater than the maximum possible consumption or pumping capacity, the water may be pumped or fed direct to the water-mains or filters or reservoir, but where this is not the case, impounding or storage reservoirs, and in some places distributing reservoirs, are provided to hold the surplus water during periods of maximum flow in rivers for use during the dry periods.

REMOVING DIRTY SAND FROM THE SURFACE OF THE PROVIDENCE, R. I., SLOW SAND FILTER, ALSO A PORTION OF A COVERED FILTER

Springs and shallow wells are developed by the construction of permanent spring or well houses, care being taken to prevent surface waters from entering supplies. Because of the limited amount of water generally available from these sources, they are satisfactory only for small communities.

Deep wells are driven or drilled through earth or rock to a water-bearing stratum and are from 40 to 1,000 feet or more deep. Sometimes these are flowing wells, but more often the water has to be lifted from the wells by ordinary pumps, deep well pumps or air lift.

Supplies are occasionally developed by the construction of underground galleries of porous material in such a way as to intercept the underground flow, or in a water-bearing stratum, as in a sand-bar in a river.

In all cases of proposed supplies, and of improvements or extensions to existing supplies, a thorough study by a competent expert should be made of the several sources, and the supply to be used should be determined as the result of such study, which should include the following factors: purity of water, possibility of contamination, need of filtration, quantity available, elevation of source in reference to point of consumption, which determines need of pumping and cost of developing, including need of storage. Study of the quantity available should include measurements of flow of river over a long period, especially during the dry season, and pumping tests of wells, springs, etc. The U. S. Geological Survey, the Weather Bureau, and frequently some of the state commissions, have considerable information as to stream flow, underground flow, maximum, minimum and average temperatures, and precipitation, which are available to anyone and are useful in the consideration of proposed supplies.

Analysis of Water

The purity of the water is determined by chemical and bacteriological analyses and inspection of sources of supply and watershed as to existing and possible pollution. The chemical analyses should be complete and cover the determination of presence of objectionable minerals, salts, odors, acids, etc., as well as past or present pollution. The bacteriological analyses should show the presence or absence of B. coli, as well as giving the total counts. The results of the analyses and of the inspection will determine the need of filtration or disinfection or both.

Many of the larger water departments maintain extensive laboratories where the purity of both the raw and the treated water is tested at frequent intervals by chemical and bacteriological analyses. In any water-supply presumptive tests for B. coli should be made regularly to determine whether the water is receiving any pollution, and in case of treatment the efficiency of the treatment may be determined by comparing the tests of the untreated and the treated waters.

Iron in the water is apt to stain clothing and be objectionable on account of the precipitate which sometimes forms. Excessive hardness makes it unsatisfactory for washing and laundry purposes and produces scale in boilers. High nitrates in waters stored in uncovered reservoirs generally facilitate the growth of objectionable algae, diatoms, etc., and with lime present, Chara may grow in

shallow reservoirs and give an unpleasant odor to the water.

Where pumping is required, the first cost and the cost of maintenance are considerably increased. In cases where the elevation of source is sufficient, it is possible to operate the entire system by gravity, and where elevation is considerable or the flow great, it may be possible in the development of the supply to utilize the surplus water, or even the water to be used for domestic purposes, for water-power.

Open and closed reservoirs, elevated tanks and stand-pipes are used for the storage of water for a reserve supply to use during emergencies, fires, and for periods of low flow, and also to maintain a satisfactory pressure in the distributing system. Reservoirs are constructed on top of hills, on the side of hills, or by building a dam of suitable material across a valley, thus causing the river water to rise to the elevation of the dam or spillway. When a reservoir is built on the side or top of a hill, it is generally built of concrete, stone, or brick masonry, or other impervious material.

Purification

Water is purified or partially purified by plain sedimentation, chemical precipitation, aeration, slow sand filtration, rapid sand or mechanical filtration, disinfection, water softening, and treatment with copper sulphate to kill algae, diatoms, etc.

Plain sedimentation is sometimes of assistance in removing suspended matter from turbid waters, and if they are exposed to sunlight the action of the sun is particularly beneficial, as it somewhat reduces the number of bacterial and other impurities. Sunlight, however, on waters high in nitrate is objectionable, as it increases algae, etc.

Sedimentation with the aid of chemicals is used with turbid and colored waters especially as a preliminary treatment for rapid sand filtration, in which case the preliminary sedimentation extends somewhat the interval of time between filter cleanings.

Aeration of some waters is of benefit in increasing dissolved oxygen and reducing carbonic acid gas. It also removes to a large degree the odors caused by stagnation of that water which is drawn from below the zone of rapid change of temperature, since this water, mixing but slightly with the upper water, contains little or no dissolved oxygen. It assists in removing odors and tastes caused by microscopic organisms, and certain forms of these organisms are considerably disintegrated by the aeration. Aeration is also of benefit in causing some forms of iron to precipitate, after which the iron is easily removed by sedimentation and rapid sand filtration.

Municipal Library Expenditures and Circulations

Reprinted from the Handbook of the District of Columbia Public Library

CITIES (ranked according to census)	Population Census of 1920	Expenditures 1919 or 1920	Per Capita Expenditures	Expenditures Per Vol. Circulated	Per Capita Circulation Volumes
Detroit	993,739	$552,415.18	$0.555	$0.259	2.14
Cleveland	796,836	536,108.91	.672	.154	4.36
*Cincinnati	493,678	256,330.14	.519	.139	3.72
*Minneapolis	415,419	178,166.76	.428	.110	3.88
Kansas City	324,410	145,879.15	.449	.165	2.72
Seattle	315,652	241,119.54	.763	.148	5.15
Indianapolis	314,194	153,813.52	.489	.197	2.47
Jersey City	297,864	96,920.73	.325	.091	3.54
Rochester	295,850	96,134.98	.325	.088	3.66
*Portland	275,898	188,946.55	.684	.128	5.33
Denver	256,369	95,000.00	.370	.102	3.62
Toledo	243,109	119,035.42	.489	.122	4.00
Providence	237,595	139,438.63	.586	.318	1.84
Columbus	237,031	37,278.00	.157	.150	1.04
Louisville	234,891	98,752.40	.420	.099	4.22
St. Paul	234,595	161,535.22	.688	.160	4.29
Oakland	216,361	135,686.40	.627	.148	4.21
Average			.503	.151	3.54

* City and county.

Asphaltic Roads in the Canal Zone

The Government Specifies Asphaltic Concrete and Sheet Asphalt for Main Roads

IN building the highways to connect the civic centers of the Canal Zone, the Government has carried out its intention of surrounding the Canal with construction of the most modern and highest class. The road engineers in the Canal Zone have first of all given deep consideration to those cardinal principles of road building: (1) the preparation of the subgrade; and (2) the provision for proper drainage. First of all, the soil of the subgrade was analyzed, and when being prepared to uphold the foundation course it was packed and rolled carefully, so as to procure the greatest possible density and compactness.

Closely allied in importance with the preparation of the subgrade was the provision for proper drainage. This was effected through the placing of culverts, the extension of drains, and the building of other means for carrying off excess water and moisture. An example of the care taken in providing proper drainage was at the Corundú River, crossing along the new asphalt highway from Balboa to Diablo. The culvert at this point was extended and improved, and a small retaining wall was built to keep the excess water from flowing back into the subgrade and under the roadway.

Concrete Base for Asphalt Top

The cement-concrete base for the asphalt wearing surface was mixed to contain 1 part cement to 3 parts of sand and 6 parts of stone. Six inches was the thickness of the base. A portable concrete mixer was used, and the illustration shows the method of constructing the base. The ponding system was used to cure the concrete, which was smoothed to a proper degree to within 2 inches of the surface of the cement gutter.

The Wearing Course

So as to insure a durable, resilient wearing surface that would undergo the heavy traffic and at the same time withstand the torrid sun of the Canal Zone, the engineers specified a sheet asphalt wearing surface to be laid over the concrete base. Texaco asphalt of a 45-50 penetration was used, mixed with local sand. A typical analysis of the native sand, as made by the Department of

PLACING AND FINISHING A 6-INCH CEMENT-CONCRETE BASE ON THE DIABLO ROAD, CANAL ZONE, PANAMA, BEFORE LAYING THE SHEET ASPHALT TOP

CONCRETE ROAD WITH SHEET ASPHALT WEARING SURFACE FROM BALBOA TO DIABLO, CANAL ZONE, PANAMA

Operation and Maintenance, shows the following:

Passing 200-100-80 mesh screens.	24.8%
Passing 50-40 mesh screens.....	12.9%
Passing 30-20-10 mesh screens..	28.0%
Passing ¼-inch screens.....	25.8%
Passing ½-inch screens.....	8.5%

The Ancon-Pedro Miguel Highway, which connects two of the civic centers of Panama Canal Zone, was paved in 1919 with sheet asphalt over a cement-concrete base. The Diablo Road, which is one of the main highways of the Zone, is paved in the same manner, and the municipality of Pedro Miguel has several streets of asphaltic concrete which were built in June, 1919. These modern pavements form only part of the Government's extensive plan to construct the highest types of highways in the Canal Zone to connect the various towns for automobile traffic.

Street Obstruction by Automobiles

A Potential Danger in Every American City

THE choking of our street areas by the parking of automobiles and the difficulty of clearing the streets for the operations of the fire department in case of a big, quick-spreading fire, is a matter which must be seriously considered by municipal officials. Most cities prohibit parking at the curb within 25 or 30 feet of a hydrant, but this does not relieve the street of congestion which often dangerously delays the fire apparatus in responding to down-town fires; nor does it relieve the firemen of the necessity of wasting precious moments in moving parked automobiles to make room for an effective handling of the apparatus. To safeguard cars against theft special locks are provided, and when a fire occurs, the owner of the parked car, the only person able to unlock it, may be at a matinee or in some remote part of the city.

The operated cars themselves present a sufficient impediment at certain moments, as was sufficiently demonstrated at a spectacular fire in Salt Lake City last year, which occurred about shop-closing time and attracted such a number of spectators in automobiles as to close several avenues of approach to second-call apparatus. Although but a few blocks away, the trucks dodged about for 15 minutes before gaining access to the fire area. This matter of street congestion is one to which traffic experts may very well give most careful attention. There is untold potential danger in it to every city in North America.—From *National Fire Protection Association Quarterly.*

Forward Steps in Municipal Affairs

Police Departments

Effective Police Protection for Residential Sections

KANSAS CITY, MO.—This city extends over a large area, and a goodly portion of the residential districts is rather thinly settled, making it almost impossible to police them with men on foot. In order to meet this situation the Police Department has established a system of police booths. These are installed at the center of a residence area, say about one-and-a-half miles square. Each booth contains two telephones, one a police signal phone, and the other a private phone with its own number.

As soon as one of the booths is ready for operation, letters are prepared and distributed by police officers to all the citizens in the district which the booth is to serve. These letters describe the service and contain a card on which is the telephone number, with instructions to the citizen to place this card in his telephone book so that if he needs a policeman in a hurry he can call direct to the booth, without having to go through the regular police switchboard.

At these booths there are stationed two motor-cycle men at all times of the day and night, and between the hours of 10 P. M. and 4 A. M. there are four men on duty. Between the hours of 4 A. M. and 10 P. M. one man stays in the booth, while one man patrols the district on a motor-cycle. Between 10 P. M. and 4 A. M. two remain in the booth, while two patrol the district, one on the motor-cycle and the other in the side-car. Riot guns loaded with buckshot compose part of the equipment of each motor-cycle.

There are two motor-cycles assigned to each booth, both equipped with side-cars, which makes them usable in wet weather, and at the same time permits the carrying of an extra passenger.

The protection afforded the districts in

WHEN THIS SYSTEM IS COMPLETELY INSTALLED, A POLICE OFFICER WILL BE AVAILABLE AT ANY PLACE IN KANSAS CITY WITHIN THREE MINUTES

which this system has been in operation has been excellent. Night prowlers and burglars have been practically eliminated from the neighborhood. The police are enabled to keep track of all strange motor-cars that come into the district and stay for any length of time. In addition, the psychological effect on the citizens has been very good, as they know that there is a police officer at a certain place, whom they can reach on short notice.

These booths are all located at intersections of principal thoroughfares so that calls from any direction can be quickly answered. The plans include the locating of these booths throughout all the residential districts, so that, working in conjunction with the police stations, they will make a police officer available in any part of the city within three minutes' time. In addition, booths have been located on the principal highways leading out of the city, so that at any desired time practically all exits can be closed to shut off escaping highwaymen.

The men stationed at the booths are also useful to motorists, as road maps and instructions can be found in all booths.

At the present time there are in the Kansas City Police Department 75 motor-cycle patrolmen and 40 motor-cycles with 25 side-cars.

MATTHEW A. FOSTER,
Police Commissioner.

Public Welfare Departments

A New Angle on the Immigrant Problem

CINCINNATI, OHIO.—This city is probably more free from the perplexing problems of immigrant colonies among its population than any other of the large cities. The percentage of foreign-born population in Cincinnati is only about 8 per cent—a smaller percentage than that in any other city of its size.

During the period of the war, when immigration was almost completely stopped, the American House, located in the midst of Cincinnati's immigrant district, had an excellent opportunity to forge ahead with its work of bringing its neighbors into contact with American ways and standards of living. Much intensive work was done during these years that could not have been done while there was a constant stream of immigrants entering the city.

When the new immigration began, after the signing of the armistice, the social agencies in Cincinnati and the Department of Health determined that the new immigrants should be taught their rights and their obligations at the very beginning, before they had a chance to develop bad habits.

In November, 1920, a joint plan of follow-up was worked out by Community Service, the Board of Health, the Better Housing League, and the Americanization Committee. These four organizations determined to see to it, first, that every newcomer is free from communicable diseases; secondly, that he and his family know how to live according to American standards of living; and, finally, that he and his family are at once put into touch with facilities for learning the language of this country and becoming citizens.

Every alien that comes into the city is met at the station by the Travelers Aid Bureau of Community Service. The Bureau gets his pedigree and the address at which he and his family are going to live. That information is recorded on a special card which is forwarded to the Department of Health. There a physician gets in touch with the immigrant and examines for communicable diseases and for serious physical defects, taking the appropriate action if any such diseases or defects are discovered.

The card then goes to the Better Housing League, which at once dispatches one of its visiting housekeepers to investigate the housing conditions. If the family is badly housed or is overcrowded, the Visiting Housekeeper sets out to remedy the condition.

The final spoke in the wheel is the Americanization Committee, which upon receipt of the card takes steps to persuade the family to learn English and to train for citizenship.

And so, instead of the community's becoming burdened with a never-ending problem of new groups of aliens settling down in filth and disease and remaining in complete isolation, the new families feel the helping hand of the community from the

very start and are assisted in solving their problems of adjustment in the land of their adoption.

Strangest of all has been the interesting revelation of this system that the immigrants coming into Cincinnati to-day are not the riffraff of a few years back, but are of a really high-grade type that soon make good citizens. The Department of Health has been able to give a clean bill of health to almost all the immigrant families they have examined. The Visiting Housekeepers of the Better Housing League find most of the families intelligent and their homes clean and well kept.

BLEECKER MARQUETTE,
Executive Secretary, Cincinnati Better Housing League.

Park Departments

An Acre of Park for Each Family

CHICO, CALIF.—A visitor to Chico recently gave the city a new slogan. He called it the "Little City with the Big Park." In many respects Bidwell Park is Chico's most distinctive feature. This wonder playground comprises 2,300 acres and is the gift to the city of the late Mrs. Annie E. K. Bidwell, wife of the founder of the city.

From records furnished by the Census Bureau at Washington it appears that Bidwell Park is the third largest municipally-owned park in the United States, being exceeded in size only by Fairmount Park, Philadelphia, and Griffith Park, Los Angeles.

A remarkable feature of Bidwell Park is its nearness to the city; in fact, it is a part of the city, having been annexed in 1918. The park proper begins about two blocks from the business district and extends eastward from the city for about nine miles along Big Chico Creek, a stream having its headwaters about forty miles east of Chico in the Sierra Nevadas. The stream flows through the park for the entire year, and the city has complete ownership of water rights, these having been a part of the gift of Mrs. Bidwell.

Words will scarcely do justice to the natural beauties of Bidwell Park. The Bureau of Entomology of the Department of Agriculture is at present engaged in listing the many different kinds of trees growing, for practically the entire tract is wooded.

CHICO'S PARK OFFERS ALL THE DELIGHTS OF THE "OL' SWIMMIN' HOLE"

The monarch of all the trees is Sir Joseph Hooker Oak, which stands in the park about three miles from the city. This mammoth oak is the largest oak tree in the world. It is 101 feet high and is named after the famous English naturalist, who was a guest of General Bidwell during his trip around the world.

The lower portion of the park, for a distance of about four miles, is in the valley. The remainder is in the foot-hills. A feature of the upper part of the park is Iron Canyon, created by Chico Creek, which has worn a deep canyon through solid lava for a distance of several miles. Iron Canyon and Hooker Oak are the Mecca for hundreds of visitors every year, who come to stop at the public camp grounds maintained by the city in one of the groves of the park.

Bidwell Park is under the exclusive jurisdiction of the Bidwell Park and Playground Commission, created by ordinance by the City Trustees. The Commission has full power of expenditure of funds and general supervision over the park.

One of the activities of the Commission is the maintenance of four swimming pools in the creek during the summer season. Temporary dams are placed in the creek, and dressing-rooms are erected of such construction that they may be removed during the winter. Hundreds of children and grown-ups use these swimming places daily, and many come from near-by valley towns for a picnic and a swim in the park during the summer months. All these facilities are free to the public, the Commission having adopted the policy of not permitting any mercenary activities within the park.

Plans and specifications have been prepared by E. J. Symmes, the Alameda architect and designer of Neptune Baths, for a permanent boating lake and large swimming pool in the lower portion of the park, nearest the city. These plans call for an expenditure of about $50,000 or more, and when they are completed Chico will have one of the finest outdoor amusement places of any interior city in California.

Chico's population by the 1920 census is 9,339. Computing the average family as consisting of five persons, Chico has more than an acre of park space for every family in the city. Can any city in America boast a better record?

C. H. DEUEL,
Member of Park Commission.

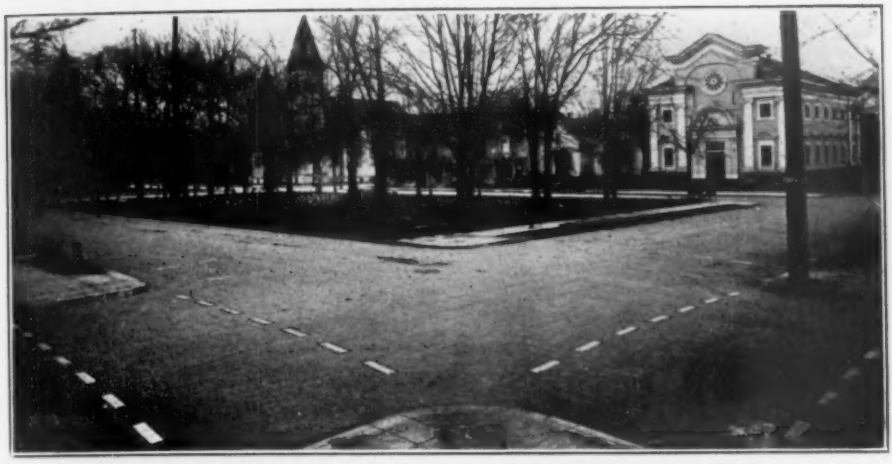
Public Works Departments

Permanent and Cheap Safety Zone Markers

PORTLAND, ORE.—The city of Portland has installed the first of its new safety zone markers. These street intersection traffic strips are white concrete blocks, 6 inches square and 2 feet long. The concrete blocks are pre-cast and made of hydraulic cement, sand and gravel. The lower part, or main body, consists of a 1:2:4 mix of ordinary gray cement. The top half-inch is made of "Medusa" or white cement in proportions of one-half cement and one-half sand. The blocks were made for the city by a local manufacturer, and in order to get a glazed and perfectly smooth surface were made face downward. The bottom of the form is a piece of celluloid, slightly curved so that when the block is inverted the top will have a crown of ⅛-inch on the 6 inches of its surface. In the bottom of the form the covering, or the white cement and sand, is first placed and then filled up with a body mix. The blocks are left in the forms for two days, taken out and stood on end, cured in steam for 48 hours, then stored in a damp place for three months before use.

In placing these blocks upon the intersections, the pavement has to be cut to a depth of 6 inches, about ½-inch larger than the block itself. Underneath, and along the sides with the exception of the top inch, is placed a cushion of one-half dry mortar. The blocks are then set, and the upper inch of the space around each block is filled with a product known as Sarco putty. This is a rather expensive asphaltic product, but it serves the purpose admirably, and the small amount used does not create a great expense.

Each summer during the past seven or eight years the city has painted traffic strips in the down-town section, the total of which approximated 15,000 lineal feet. The accumulated cost of this painting and repainting each summer has amounted to date to about $2 per lineal foot, and the painting has to be done each summer, as it is worn away by traffic and washed away by the street flushers. The concrete block will probably outlast the pavement itself. Each block



PORTLAND'S NEW MARKERS ARE DISTINCT, PERMANENT AND ECONOMICAL

costs $1. The entire intersection is counted as 288 lineal feet. The total cost of block, cutting pavement, setting, truck-work and material is $4.17 per block, and as there are 56 blocks at this intersection, the total cost of marking the intersection is $233.52. This gives a cost of about $.82 per lineal foot, in comparison with the $2 accumulated cost of painting over a four- or five-year period.

There are one or two small items which it might be well to note in the setting of these blocks. The first one is that in stretching the chalk line it should be done in such a manner that an exact or true line will result, as any deviation of these glaring white blocks in a black pavement shows quite plainly. Also, after the joints are filled with the hot putty, an ordinary soldering iron may be run around the edge to completely seal it to the black pavement.

The following is quoted from the report of the Chief of the Bureau of Maintenance on the traffic strips at West Park and Clay Streets:

"In watching the traffic at this intersection, I am quite confident that a better solution is arrived at in this construction than with the painted strips, as there is no rocking of the blocks nor any movement whatever that can be noticed under the heaviest trucks that pass. There is nothing that can hurt them nor in any way destroy them, as they are three months curing, partly in steam, and exceptionally hard. Street flushing will only serve to keep them clean and keep the white surface always in view of passing pedestrians. From the prior painting jobs that this department has done for the Police Traffic Bureau, it has been learned that there is a total of approximately 15,000 linear feet of traffic strips to be painted. Each year this has been done, and each fall the strips disappear from the streets.

"I am of the opinion that should this construction be substituted in this city for painting, and should the Council decide that they wished permanent traffic strips throughout the down-town section, the concrete blocks are the best solution."

R. G. McMULLEN,
Chief, Bureau of Maintenance, Department of Public Works.

Highway Departments

Municipality Takes Over Street Cleaning

PHILADELPHIA, PA.—For many years prior to 1921 Philadelphia entrusted its important street cleaning functions entirely to private contractors. From 1869 street cleaning by contract was made obligatory by an act of the Legislature, and from this obligation the city was not released until 1919, when the Legislature granted the city a new charter. The new charter went into effect January 5, 1920, but the street cleaning provisions of it were not made operative until January 1, 1921. This period of a year was necessary because contracts had been let for 1920 prior to the new charter. The delay provided time to prepare for the new order of things.

This year municipal forces are cleaning

the streets in the central district, which is the most frequented of the city, to the general satisfaction of the public. The remaining districts are still cleaned by contract. The city has also purchased and is operating the garbage reduction plant formerly owned by a private company which has held a monopoly on garbage reduction for several years. The existing street cleaning contracts expire on December 31, 1921, but are terminable on September 30 at the option of the city, if three months' prior notice is given. The complete abolition of street cleaning contracts, whether on October 1 or December 31, depends primarily on the providing of funds for the purchasing of plant and equipment, but it is anticipated that a full municipal program will be put into effect by January 1, 1922

JAMES W. FOLLIN,
Chief Engineer, Bureau of Municipal Research.

Health Departments

Community Public Health Meetings Increase Public Interest

BOSTON, MASS.—During February and March there were held in nine community centers in Boston public meetings with special programs arranged for the purpose by the Service Unit organization under the joint auspices of the City Health Department and the Department for Extended Use of Public Schools. The series of meetings had for its slogan "Your Good Health and Mine." In each program were motion pictures relating mainly to health subjects, singing by the audience of songs in the spirit of the occasion, with song leader and pianist, constructive information on the screen by means of "silent talks," always a patriotic feature to enable the programs to contribute to good citizenship, and a ten-minute talk by a representative of the Health Department on the subject of cooperation in preventing common contagious diseases.

A feature of each of the series of meetings was a brief period in which men and women in the audiences were encouraged to ask questions for the health man to answer. This proved an exceptionally good opportunity for the Department representative to sense the sentiment of the community, and an equally good chance for the people present, to "say to his face" some of the things they might have been thinking about for a long time.

The motion pictures used in these neighborhood health meetings have related to such subjects as disposal of sewage in cities, forms of bacteria, care of the teeth, personal hygiene, swimming, life saving, first aid, etc. Each program has also included films of general instructive character, not entertainment so much as enjoyable films of constructive value.

The information and suggestions given by means of the "silent talk" on the screen included a number of familiar "Healthgrams" such as:

These things remember,
If you are wise:
Fresh air,
Good habits,
And exercise.

Foods should be fresh
and pure and clean;
Be on your guard
for dirt unseen.

And even more specific health tips were in order.

The attendance and interest of the men and women clearly indicated that the meetings were well worth while. Where the character of the audience made it advisable, the speakers delivered their addresses in Yiddish or Italian.

The meeting in the West End had a particular local value because here the Health Department, in coöperation with the Red Cross, District Nursing Association, and several other similar organizations, has established the No. 1 neighborhood "Health Unit" for Boston, at No. 17 Blossom Street. This Unit has become a neighborhood institution of recognized importance to the welfare of that section of the city.

One outcome of the coöperation which resulted in these neighborhood meetings is that Health Commissioner Woodward and Mr. Mulroy, director of the school centers, have worked out a plan which is intended to make each school center building a permanent local health center, at which the district officers of the Health Department may have headquarters and meet people of their districts at stated intervals.

PETER F. KELLEY,
Director of Health Education Service of the Health Department.

Selecting the Internal-Combustion Engine for the Municipal Power-Plant*

By W. F. Schaphorst, M. E.

THE internal-combustion engine, according to actual brake tests, is the most efficient of all heat engines. Efficiencies as high as 33 per cent are not uncommon. Yet we find that engines of this type are not so popular in municipal power-plants as the less efficient prime movers—steam engines and steam turbines. True, the Diesel type of engine is being used in municipal plants and it is making rapid and encouraging headway. Why, though, is it not being adopted more rapidly?

The answer is, the first cost has been considered too high. The Diesel engine was used in Europe long before it came to the United States. American engineers knew of the existence of the Diesel engine and knew of its high efficiency, yet they did not specify it, because fuel was so cheap here that its use would not have been economical. It is not always economical to use the most efficient engine. Where coal is cheap and fuel oil is expensive, the most efficient Diesel engine cannot compete with the much less efficient simple steam engine. The cost of the engine, the cost of fuel, length of life, upkeep cost, operating cost, cost of housing, taxes, insurance, interest on the investment, scrap value of equipment where replacements are made, rent, etc.—all these points must be given proper consideration before deciding on any important new apparatus or improvements.

The reason for the efficiency of the internal-combustion engine is that the fuel and air are fed directly into the cylinder of the engine itself, and compression, ignition, combustion, expansion, and exhaust all take place within the cylinder. The opportunities for loss are thereby reduced to the very minimum. The steam engine is less efficient because combustion takes place under a boiler and a very large percentage of the heat is wasted up the chimney and is radiated through the boiler setting; some fuel goes to waste with the ash; the steam is passed through pipes which radiate more

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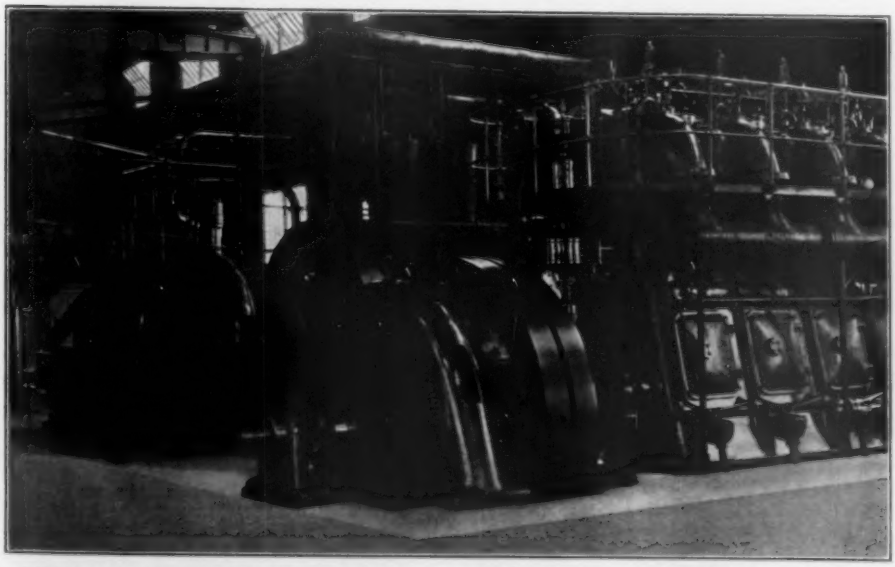


INTERIOR OF POWER-PLANT AT BRYAN, OHIO, SHOWING A 520-HORSE-POWER BUSCH-SULZER-DIESEL ENGINE AT THE RIGHT, AND TWO 225-HORSE-POWER ENGINES OF THE SAME TYPE AT THE LEFT

heat into the atmosphere; there is a friction loss in the piping, and, lastly, a cylinder condensation loss in the steam engine cylinder. In the internal-combustion engine many of these losses are eliminated and the others are confined within the walls of the cylinder. Some heat, of course, is lost through the walls of the cylinder, but in certain types of modern internal-combustion engines a large percentage of this heat is recovered by generating steam within the cylinder jacket and using the steam for driving a steam engine. The rest of the heat is lost through the exhaust, but this heat also is often utilized for the generation of steam.

For municipal power-plant service the Diesel engine easily predominates. It is an excellent engine and certainly has not yet been appraised at its real worth. It was first introduced into this country by Adolphus Busch of St. Louis, in 1898.

Disadvantages and Advantages of Diesel Engines

A great many engineers—not to mention those who are not engineers—believe that the Diesel engine is not reliable; that it is too complicated to give durable, economical, and all-around, year-after-year satisfactory service. This, however, is far from the truth in view of the statement by one authority that out of the total of 370,000 horsepower manufactured to date, over 98 per cent is still in actual service. This means that only 2 per cent has been discarded. Of this 2 per cent, however, one-third was demolished by fire, so there remains only 1⅓ per cent as having been discarded. The reasons for discarding are not given. In view of these facts, then, and in view of the fact that present users are sending in repeat orders, it must be admitted that the Diesel engine has merit—that it is worthy of serious consideration.

To be sure, the Diesel engine is not ideal from every angle. It has a number of general faults. The foremost arguments advanced against its use are these:

1. *Cost.*—The initial cost of the Diesel engine is high.
2. *Starting.*—It is sometimes difficult to start.
3. *Complexity.*—Its starting mechanism is liable to be complex.
4. *Quality of oil.*—Changing the quality of fuel oil is liable to influence the certainty of operation of the engine.
5. *Altitude.*—The Diesel engine, like all internal-combustion engines, is affected by changes in altitude.
6. *The piston.*—It is sometimes difficult to cool and oil the piston; as a result, the piston is liable to be short-lived—from three to six years.
7. *Single-acting.*—It is difficult to make a Diesel engine double-acting, on account of packing and heating troubles.
8. *Heavy.*—Reciprocating parts are heavy.
9. *Foundations.*—Massive foundations are required.
10. *Governing.*—Trouble is sometimes experienced with governors and regulation.
11. *Fly-wheels.*—Heavy fly-wheels are necessary.
12. *Noise.*—Some Diesel engines are noisy.
13. *Lubricant.*—High-grade oil is needed for lubrication.

The above disadvantages of the Diesel engine may loom up large, but there are, on the other hand, the following advantages to outweigh them:

1. No costly fuel supply apparatus. Fuel oil is more easily used than coal and can be handled mechanically with a pump, and the cheaper grades can be used.
2. No fireman. Less labor is required to operate a Diesel engine than to operate a steam power-plant of the same capacity.
3. No boiler feed pump.
4. No water purification plant.
5. No steam piping.
6. No condensers with their auxiliaries.
7. No smoke.
8. Smaller power-house with less floor space.
9. No steam boilers with attendant up-keep, etc.
10. No chimney.
11. Not necessary to bank fires.
12. Automatic and close regulation of fuel as well as power.
13. Continuously high efficiency.
14. The process of combustion takes place in the Diesel engine under almost ideal conditions.
15. No engineers' licenses.
16. No preliminary heating-up.
17. No ashes, dirt and dust.
18. No stand-by losses.
19. No overheated buildings.
20. Larger quantities of reserve fuel easily stored.
21. No depreciation on stored fuel.
22. No losses on fuel in transit.
23. Power available immediately. The Diesel engine can be started in less than three minutes, and full load can be pulled from the very start.
24. Highest thermal efficiency known.
25. Practically same economy at half-load as at full load.
26. The operating cost of the comparatively small Diesel-driven power-plants is frequently equal to or even better than the operating cost of large steam-driven

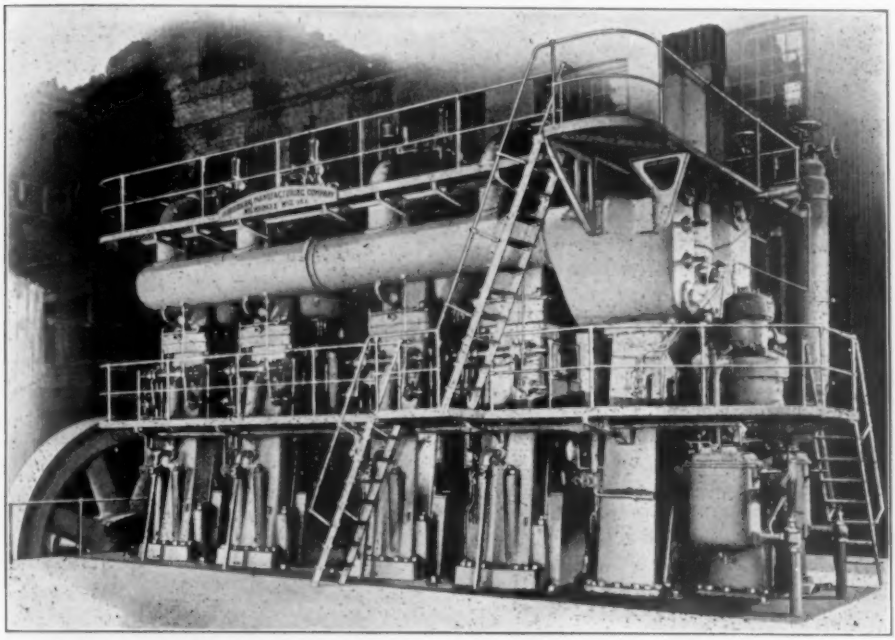
central power-plants.

27. It costs less to move a Diesel engine from one locality to another than to move an entire steam power-plant of the same capacity. This is because the Diesel engine is practically a "self-contained power-plant."
28. Engine repair costs are no higher than with steam plants.
29. It has been proved that much of the heat now wasted from the Diesel engine can be utilized—about 12½ per cent from the heating jacket and 15 per cent from the exhaust, and this total of 27½ per cent is 27½ per cent of the "initial heat value of the fuel."

plants of equal or better efficiency cannot be built at the same low cost. In fact, too often it is the case that "first cost" determines the kind of purchase, rather than the ultimate economy.

Location Influences Economy of Diesel Installation

Whether or not a Diesel engine is suitable for your municipal power-plant depends largely upon the location of your city. What is the cost of fuel oil in your locality? Is oil cheap and coal dear? Or is the reverse the case? In general, the use of the Diesel engine is discouraged in Eastern Seaboard States on account of the high cost of oil and the cheaper coal. Nevertheless, many engines of this type are in profitable operation in the Eastern region. The Middle-Western and the Southwestern States are logical Diesel engine states, because of the relative prices of oil and coal. More than half of the total Diesel horse-power of the United States—in fact, nearly 70 per cent—is installed in seven Central and Southwestern States—Arizona, New Mexico, Texas, Oklahoma, Kansas, Missouri,



A NORDBERG 2,000-HORSE-POWER DIESEL ENGINE DIRECT-CONNECTED TO A 1,350-KW., ALTERNATING-CURRENT GENERATOR

The two-stroke cycle Diesel engine, which is making rapid headway, has these additional advantages:

1. Accessibility.
2. Still smaller space.
3. Provided with cross-head, allowing large clearance of the piston in the cylinder.
4. Exceptional rigidity and smaller weight.
5. Does not require closely fitted bearings to prevent knocking, the pressure being always in one direction.

In general, the sizes of Diesel engines that are most popular in municipal power-plants are smaller than 2,000-kw. This is due to the fact that small steam power-

and Louisiana.

Useful for Peak Loads

It does not pay to operate a large steam power-plant on a small load. Consequently, it sometimes pays to install an oil engine to handle the load during the "off peak" periods, in the meantime banking the fires under the boilers of the steam plant.

Again, steam power-plants are sometimes unable to take care of peak loads which come on suddenly, as during a rain-storm, or at night when extra illumination is wanted suddenly, or once a year during an unusual occurrence in the city. A gasoline or oil-engine-driven unit can very nicely take care of such a peak load. It is better to invest in a relatively inexpensive unit of this kind for intermittent work than to spend considerably more for a much larger steam plant that would operate at such peak loads during a total of only a few hours per year. Sometimes, also, it is impossible or very costly to find space enough in which to place new boilers and engines. For example, in one instance a small 80-horse-power semi-Diesel oil engine is belted to a generator for handling peak loads. The floor space occupied is only 15 by 30 feet. The cost of operating this oil engine, including water, oil, etc., averages only $9.49 a day.

Combined Plants

Sometimes combined steam power-plants and Diesel-driven units are to be recommended. For example, where good use can be made of all exhaust steam from a steam power-plant, the Diesel engine cannot compete. In other words, the Diesel engine is not profitable where large amounts of exhaust steam can be profitably used. But where there is a large enough surplus of exhaust steam which must be allowed to go to waste, it is better to install Diesel engines of such power that no exhaust steam will be wasted.

First Municipal Installation

The first municipal water and light plant in the world to install Diesel oil engines is in Menasha, Wis. In this plant four engines were installed in 1905, 1911 and 1913, totaling 600 horse-power. One thousand gallons of water are pumped against 49.5 pounds pressure with 0.05 gallons of fuel oil. The cost of fuel per kilowatt hour is only 4 to 6 mills. The total cost of pumping 146,000,000 gallons, including the operation of the water and city-lighting plant, distribution, office and depreciation, amounted to only $4,121.25 for one year.

In another municipal plant the first Diesel engine was installed in 1905. No additional steam equipment has been purchased since then. One of the officials writes:

> " . . . . it [the plant] was built in 1892. It represents an investment of about $200,000, of which all but $22,500 has been from profits, since commercial lighting and power were added to the original street lighting plant in 1898, and at the present rate the entire debt will be wiped out within a year. Our rates have always been the lowest in the state, and nearly all the factories of this city are operated by the power of this plant—about 1,200 horse-power in motors—not to mention a heavy lighting load."

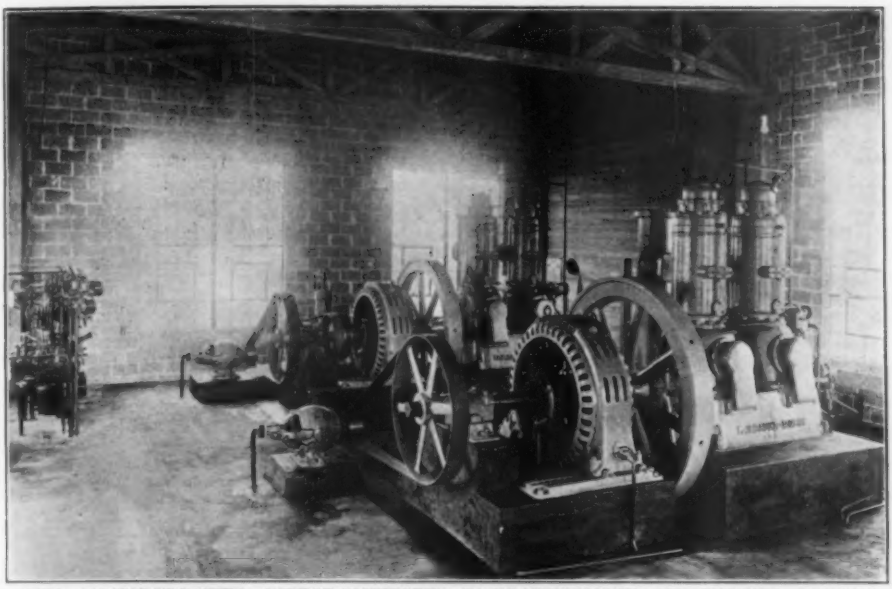
Another municipality reports the cost of only 8 mills per kw. hour on the switchboard with the use of Diesel engines. The water-works pumps are motor-driven in duplicate. This plant sells enough commercial service so that street lighting and water service is free to the city.

Use in Small Towns

Even in small towns having a population of less than 2,000, it has been proved profitable to install Diesel engines. For example, Kiowa, Kans., according to the last census has a population of less than 2,500. In 1908 the town installed a steam power-plant consisting of two 16 by 6 feet horizontal, return-tubular boilers and a simple high-speed steam engine directly connected to a 75-kv.-amp. generator. Later another simple high-speed engine directly connected to a 100 kv.-amp. generator was added. In 1914 this steam power-plant was replaced by a Diesel engine. The Diesel engine has been operating steadily ever since, one of the steam units having been retained in case of shut-down of the Diesel engine. Upon making this change, the fuel cost was reduced from 5 cents per kw. hour to only 3 mills per kw. hour, or almost 95 per cent.

Fuel Oil

There is to-day an enormous demand for gasoline, most of which is derived by distillation from crude oil. This distillation leaves a residue much greater in volume and weight than the gasoline taken from it. The residue, which is a fuel oil, is an excellent product for use in the Diesel type of engine.



TWO 100-HORSE-POWER, DIRECT-CONNECTED FAIRBANKS-MORSE OIL ENGINES DRIVING TWO GENERATORS IN PARALLEL, WHICH IN TURN DRIVE TWO 6-INCH, 500-GALLON FIRE PUMPS

The increasing popularity of the motor vehicle for social and business purposes promises a still greater supply of this kind of fuel.

We have all of us frequently heard and read the claim that oil is becoming scarce—that our sources of supply are on the verge of exhaustion. Oil authorities assure us, however, that for many years there will be no danger whatever of depletion. Many sources of oil fuel supply in the United States have not yet been touched. Tremendous quantities of oil will be shipped in from virgin fields in Canada, Mexico, the West Indies, and South America.

Shale oil has been used for a number of years for Diesel engines. It is stated by one authority that the opening up of vast deposits of oil-bearing shale will yield a supply of fuel oil as great as that of all fuel oil brought to the surface to date. Tar oil is a by-product in the manufacture of artificial gas and has been used successfully abroad. It is another source of supply of fuel.

It is quite probable that oil prices will advance as years roll on, but so will the price of coal. The Diesel engine will always be an active and worthy competitor of all steam prime movers.

Other Internal Combustion Engines

Gasoline and kerosene engines have made practically no progress in the municipal power-plant field. Occasionally such an engine is used for pumping water or for sudden peak-load service. The high cost of the fuel, however, together with trouble from hot bulbs, electric ignition systems, distributing shafts, cams, valves, etc., usually causes the purchaser to turn to something less troublesome and less expensive to operate. Although in some types these faults have been largely and perhaps entirely overcome, it is well to bear the objectionable features in mind when purchasing.

A type of plant that is commonly frowned upon now is the producer gas plant. Even well-informed engineers advance the opinion that the gas producer plant has passed its peak. As was the case with the Diesel engine producer, gas units are now "successful" in Europe, whereas in this country they generally are not so successful. In Europe plants as small as 10 horse-power are commonly found. Gas producer units can operate on very cheap fuel—peat, lignite, low-grade bituminous and anthracite coals, wood, charcoal, oil-shale rock, tanbark, etc. Almost anything that contains

combustible matter or that will burn can be utilized in a producer. The producer should therefore be ideal in the Northwestern and Southwestern States, where there is an ample supply of cheap lignite.

One writer gives the following as reasons why producer gas plants are not more commonly used in the United States:

1. American manufacturers have copied foreign types not suitable for American fuel; consequently, there have been many failures. They have not displayed sufficient initiative to apply the producer to our own fuels.
2. They have been regarded as "too much trouble." Sufficient patience has not been displayed.
3. Attempts have been made to produce clean gas without using gas washers or tar extractors.

Producer gas plants have apparently passed through the experimental stage and are now making some headway in municipal power-plants. For example, the city of Allentown N, J., recently installed a gas producer plant, which, according to the Mayor of that city, A. Robinson, is working perfectly. They are very economical when they operate satisfactorily, but they have not made progress equal to that of the Diesel or semi-Diesel engine, principally because they require greater skill to operate. Improvements are constantly being made, however, and it is quite possible that perfectly satisfactory producer gas plants will soon be more common than at present. It is reported that at the present time about 300 plants of this type are in operation in this country.

In small municipal installations where steam power is used, it is not at all uncommon to find a coal consumption of 10 pounds per horse-power hour, equivalent to 130,000 B. t. u. Compared with this, one manufacturer of a producer gas plant claims only 10,000 B. t. u. per horse-power hour at full load. This manufacturer goes further in that he recovers heat from the producer and uses it for heating buildings and for furnishing hot water. He claims that with coal costing $15 per ton he can furnish 100 brake horse-power for 75 cents per hour; with coal at $10 per ton, 50 cents per hour; and with coal at $5 per ton, 25 cents per hour. A power-plant device that will make one pound of coal produce as much power as can be produced from two pounds by other means is surely worthy of attention and mature thought.

The Cost of Repairing Bituminous Pavements

THE first sheet asphalt pavement in Albany, N. Y., was laid in 1889, and since that time there has been laid over 336,000 square yards, of which about 190,000 square yards, or more than one-half, has been laid since 1914. There was no asphaltic concrete pavement laid in the city previous to 1914, but since that time about 38,000 square yards has been laid. The city has laid no bitulithic pavement, but there is about 24,000 square yards within the city limits, laid by the State Highway Commission. Thus there is about 400,000 square yards of bituminous pavement in Albany, and the tendency is to use more asphalt from year to year in paving residential and light traffic streets where the grades will permit.

With this large yardage, equivalent to about 22½ square miles of pavement 30 feet wide, repairs are necessary, and as the pavements become older, more and more repairs are necessary to properly maintain them. The Department of Public Works has had the asphalt repair work done by contract because the city has no facilities for doing the work itself. The prices per square yard for repairing the asphalt pavements have been increasing year by year, as follows:

1915	$1.23½
1916	1.63
1917	2.10
1918	2.10
1919	2.20
1920	2.60

Considering the cost and difficulty of securing labor and materials in the last few years, these prices have not ben unreasonable. The price per square yard includes cutting out and removing the old asphalt, cleaning the space to be repaired or renewed, and furnishing and placing the new binder and the new asphalt wearing surface. If any part of the concrete foundation has to be renewed, this is paid for at a fixed price per cubic yard.

Establishing Rates for Service Rendered by Public Utilities by Contract—Part II

A Discussion of the Legal Status of Contracts Between Utilities and Cities, of Municipal Ordinances and State Public Utility Commission Decisions

By Walter A. Shaw
Consulting Engineer, Chicago, Ill.

IN one of the recent cases decided by the Illinois Supreme Court on October 23, 1920, Maclay Hoyne v. The Chicago and Oak Park Elevated Railroad Company, 294 Ill., 413, in which the right of the elevated railroad company to increase its passenger fares from 5 cents to 6 cents for each passenger was challenged, the Court said:

"The Supreme Court of the United States, in Home Telephone Company v. Los Angeles, 211 U. S., 263, has stated it as the settled doctrine of that court that the state may authorize one of its municipal corporations to establish, by an inviolable contract, the rates to be charged by a public service corporation or natural person for a definite term not grossly unreasonable in point of time, and that the effect of such a contract is to suspend, during the life of the contract, the governmental power of fixing and regulating the rates. It is further stated, however, in that case, that for the very reason that such a contract has the effect of extinguishing pro tanto an undoubted power of government, both its exercise and the power to make it must clearly and unmistakably appear, and all doubts must be resolved in favor of the continuance of the power. It is the settled doctrine of Illinois that neither the state nor our constitution has given cities and villages, or any other municipality in this state, the right or power to establish by such a contract the rates to be charged by railroad companies, whether street railways or railroads organized under the general Railroad Act."

The Court further said:

"The result of our holding being that neither the constitution of this state nor the Legislature in any act has given to the city of Chicago or to any other city of this state the authority to make an inviolable contract with any street railway or any railroad company with reference to the rates of fare which such companies shall charge passengers, it follows that the city of Chicago's contract with appellees with reference to fares to be charged by them is not binding on the state. As against the state's right to fix the rates of fare for appellees through the Commission, such contract has no binding force. (Detroit v. Detroit Citizen's Railway Co., 184 U. S., 368.) To hold otherwise would be, in effect, to oust the state of one of its sovereign prerogatives. Section 23 of Article 4 of our constitution, providing that the General Assembly shall have no power to relieve or extinguish, in whole or in part, the indebtedness, liability or obligation of any corporation or individual to this state or to any municipal corporation therein, is no bar to the Legislature asserting its right to regulate and fix rates for railroad companies. Giving the words 'liability and obligation,' used in that section, their broadest meaning, the provision would then not have the effect to make valid and binding, as against the state, the rates of fare established by the city of Chicago and appellees in their contracts. The liability or obligation spoken of in that section of the constitution only has reference to liabilities and obligations which the corporation and the municipality have the legal right and power to make, not only as between themselves but also as against the right of the state to interfere. We cannot interpret this provision of the constitution to give cities the right, by contract, to establish rates for railroad companies when the same constitution in other sections has vested this right solely in the Legislature. For the same reason it is equally clear that the provisions of the state and Federal constitutions providing against the passage of laws by the state impairing the obligation of contracts are not applicable to the contracts in question."

In the case of The Chicago Railways Company v. The City of Chicago (292 Ill., 190), in which the city of Chicago was urging that the settlement ordinances passed in 1907 constituted valid contracts with the street car companies as to rates of fare, our Supreme Court said:

"A question argued at length is whether the General Assembly, acting through the State Public Utilities Commission as its authorized agency, may lawfully change the rate of fare fixed by contract between a municipality and a public utility, such as a street railway corporation. That question was recently given full consideration upon the same authorities here cited and relied upon, in the case of Public Utilities Commission v. City of Quincy, 290 Ill., 360, and it was there held that the General Assembly has such power. It was there determined that the power to regulate rates to be charged by a public utility is vested in the General Assembly; that the General Assembly has never conferred upon any municipality power to make inviolable contracts for rates for a public utility; that such power of a mu-

nicipality is not to be implied from authority granted to control streets and regulate the use thereof by public utilities."

The fact is, that Illinois was the pioneer in establishing the law as to the power of the state to regulate rates. In the celebrated case Mann v. People, 69 Ill., 80, and affirmed by the United States Court, 94 U. S., 113, it was held that the power to fix and regulate rates as to public utilities was a common law, one inherent in the state.

From a legal standpoint there never was a proposition of law more definitely settled as to the rights of the state through its police power to fix and determine just and reasonable rates, or the duty of the members of the Public Utilities Commission under their oath of office.

Thus far I have dealt only with the legal phase of the problem. There are other phases which may be discussed with profit.

Referring to resolutions adopted by the City Council of Quincy, Ill., the following facts are at least interesting:

On May 19, 1914, the Quincy Gas, Electric and Heating Company made formal application to the Public Utilities Commission of Illinois for authority to change its rates for gas service in the city of Quincy, Ill. On July 7, 1914, the city of Quincy (afterwards designated the petitioner in the proceeding) filed with the Commission a cross-petition and complaint, among other things alleging "that the present rates for gas and electricity and the proposed rates for gas in the said city of Quincy are unjust, unreasonable, discriminatory, and preferential; and praying that the Commission will make the necessary and proper investigation to determine what shall constitute just, reasonable, non-discriminatory, and non-preferential rates * * * and enter an order fixing such just, reasonable, non-discriminatory and non-preferential rates, and requiring the observation thereof."

On July 14, 1914, the company filed its answer to the cross-petition and complaint, stating among other things: "But it is denied that the rates for gas and electricity in effect in the said city of Quincy are in excess of the just and reasonable rates; that the schedule of rates now in effect is discriminatory and preferential."

On March 1, 1916, the company filed a further reply to the cross-petition and complaint filed by the city of Quincy, alleging among other things that:

"On April 5, 1911, the city of Quincy enacted an ordinance granting to the Quincy Gas, Electric and Heating Company, respondent herein, permission to construct, maintain, and operate an electric light, power, and heating system in the city of Quincy, for a period of thirty years, and providing a schedule of rates to be charged for such service and the manner in which such rates, from time to time, might be changed, * * * (9) that in keeping and performing the various covenants and agreements contained in the said ordinance agreement, the respondent has relied upon the said ordinance agreement constituting a valid, binding, and legal contract between the said city of Quincy and the respondent, and that the said city of Quincy has received and accepted the benefits arising from the said performance and the expenditures of the said large sums of money, (10) that the respondent has at no time consented that the rates charged by it for electric current furnished said city of Quincy and its inhabitants shall be reduced below the schedule of rates filed with this Commission on February 10, 1914, (11) that the rates charged by the Quincy Gas, Electric and Heating Company for electricity are not excessive rates, under the said ordinance agreement, (12) that, in view of the terms and conditions of said ordinance agreement, this Commission has no jurisdiction to investigate and determine the rates to be charged by respondent, and that only a court of law or equity has such jurisdiction, * * * (16) and that, until the said ordinance agreement is amended as aforesaid and the respondent is reimbursed by the said city of Quincy as aforesaid, this Commission has no jurisdiction to investigate and determine the rates of charge to be made by respondent for electricity furnished the said city of Quincy and its inhabitants, nor has the Commission authority to compel respondent to reduce the rates provided for in the said ordinance agreement unless consented to by the respondent, and that the said act entitled 'An act to provide for the regulation of public utilities' is, as to respondent, unjust, unreasonable, confiscatory, void, and in violation of Section 1 of the Fourteenth Amendment and Section 10 of Article 1 of the Constitution of the United States." (I. P. U. C., V. 4, pp. 424, 424, 425 and 426.)

It Is a Poor Rule That Does Not Work Both Ways

Thus, in 1916, the city of Quincy was calling upon the Commission to fix and establish lower rates than those provided by a franchise ordinance. In defense the company urged that the ordinance constituted a contract, and for that reason the Commission did not have jurisdiction and that a variation from said ordinance rates would violate the Constitution of the United States. When the scene is shifted to 1919 and 1920, by reason of economic conditions brought on by the Great War, and it becomes neces-

sary for the Commission to raise rates, in many instances exceeding rates fixed by ordinances, the city of Quincy shifts its position and claims the rates to be charged are those fixed by so-called contract ordinances and that any annulment of them would violate the Constitution of the United States. On the other hand, you are not now hearing the utility companies complaining of the action of the Commission in fixing rates exceeding ordinance rates.

It is unnecessary to argue that if the Commission has power to fix rates lower than those set forth in a so-called contract ordinance, if found to be excessive after investigation, the Commission likewise has power to fix rates higher.

The Commission in disposing of the cross-petition and complaint issued an order on May 7, 1917, Case 2523, I. P. U. C., V. 4, p. 423, ordering the company to place in effect rates substantially lower than those permitted by the city of Quincy, and the company obeyed the order. In order to take such action, necessarily the Commission was required to hold that rates found just and reasonable by it must prevail irrespective of those set forth in so-called franchise or contract ordinances.

The Illinois Commission early in its existence clearly declared itself as to its duty and power to fix and establish just and reasonable rates, contract ordinances to the contrary notwithstanding.

In the case of Cook County Real Estate Board v. Chicago Surface Lines et al., case 3281, I. P. U. C., Vol. 2, p. 291, passed September 29, 1915, the Commission held that:

"The Commission was given full jurisdiction in the Illinois Public Utilities Law over all questions involving the service of public utilities. In the exercise of its powers under the law, the Commission from all the evidence in the case believes that trailers should be operated by respondents, and the order will so provide."

This order was confirmed by the Illinois Supreme Court, which was sustained by the United States Court. (City of Chicago et al., v. Wm. L. O'Connell, 278 Ill., 591.) This order of the Commission, heretofore referred to, directing the operation of trailers, was in direct conflict with the settlement ordinances of 1907.

In the case of Polo Mutual Telephone Company and the intervening petition of the city of Polo, Illinois, No. 3121, I. P. U. C., Vol. 3, p. 31, decided December 23, 1915, Commissioner Yates speaking for the Commission, after quoting many court decisions, held that:

"In the present case it clearly appears that the legislative department of this state has never divested itself of the power to regulate rates of telephone companies, and our conclusion is that this Commission is not bound by the so-called contract entered into between the city of Polo and the Polo Mutual Telephone Company, in so far as said contract attempts to establish the rates that shall be charged by said telephone company."

In raising rates during the last few years, the Commission first applied the universal rule laid down by courts—"The utility is entitled to a fair return upon the fair value of the property," and the findings established early in its existence as to its jurisdiction versus so-called contract ordinances so clearly settled by the courts.

The Purpose of State Commissions

Regulation came about by reason of insistent demands by the public to correct abuses by so-called monopolies engaged in the utilities field, upon which the public was dependent without having effective instrumentality for protection. The keynote of all regulatory laws is that the public shall receive adequate services at just and reasonable rates. The fact is that state commissions were created for the very purpose of breaking so-called contract ordinances. In the pre-war period the public believed that many of the rates authorized by ordinances were excessive, and necessarily if the State Commission was to give any relief, the rates prescribed by ordinances or otherwise must be disregarded. That part of the public which now accuses the Commission of being contract-breakers and corporation tools by reason of disregarding those so-called contracts, is responsible for obtaining decisions from various state courts and even the United States courts, as hereinbefore referred to, that the rates prescribed in these ordinances must be set aside when it is determined, as provided by law, that the rates so fixed are unjust, unreasonable, insufficient, or excessive. From the point of view of that same part of the public, in the pre-war period the test applied to determine the popularity of the Commission was the extent to which it lowered rates and broke so-called contracts.

Apparently there is a movement on foot

to change the laws of Illinois to the effect that any rates or charges for utility service fixed by so-called contract ordinances shall prevail and remain unchanged during the life of the ordinance. This means that the public would be bound without recourse to pay the rates for the term of the ordinance, which may be based upon present high prices of labor and material. Suppose a franchise expires now and the utility demands a new ordinance very favorable to itself and greatly to the disadvantage of the public, under the threat of discontinuance of service. Is it not possible under such conditions to have a great wrong forced upon the public without recourse? It will be remembered that the street car franchise recently expired in Toledo, Ohio, and the company, in order to compel the city to comply with its demands, removed all its street cars from the city during the night.

The Supreme Court of this state in the Danville case above, back in 1899 when times were normal, said:

"It is impossible to determine with absolute or even tolerable certainty what changes a few years might work in the character and reasonableness of rates to be charged for water-supply. No contract is reasonable by which the governing authority abdicates any of its legislative powers and precludes itself from meeting, in a proper way, emergencies or occasions that may arise."

The Court of Appeals of New York in passing upon the constitutionality of the New York emergency housing law said (reported in *Chicago Tribune*, March 9, 1921):

"Either the rights of property and contract must, when necessary, yield to the public convenience and the public advantage, or it must be found that the state has surrendered one of the attributes of sovereignty for which governments are founded, and made itself powerless to secure to its citizens the blessings of freedom and to promote the general welfare."

Shall the state surrender one of the attributes of sovereignty for which governments are founded, and make itself powerless to secure to its citizens the blessings of freedom by reason of present agitation, largely political, growing out of economic conditions as a result of the great World War? There can be but one answer. No.

Acknowledgment.—From a paper read before the Iowa and Illinois Section of the American Water Works Association.

Granite Block Paving on Macadam Base

Experiment in Relaying Pavement is Successful in Providence, R. I.

When the Department of Public Works of Providence, R. I., had to relay a considerable yardage of old granite block pavement last year, the engineers decided to use an asphalt macadam base under the blocks. The old granite block pavement was originally laid partly on a 6-inch cement-concrete foundation and partly on a rolled broken stone base. Much of the pavement had settled in places after undergoing considerable traffic.

The first step was to take up and clean the old blocks thoroughly, no recutting being necessary. The subbase was of gravel, varying in thickness up to 8½ inches. This subbase was rolled thoroughly, and on top of it was placed 2-inch trap rock, which was rolled to an average depth of 3 inches. Smaller sized trap rock was spread and rolled to fill the larger voids.

This stone was then given a penetration treatment of No. 96 Texaco asphalt, using about 1½ to 1¾ gallons per square yard. Stone chips were then spread, and the base was rolled. Following this, a sand cushion 1 inch or more in depth was spread on the asphalt macadam base, and on this cushion the granite blocks were relaid.

After the blocks were laid, and a small amount of stone chips had been swept into the interstices, the joints were filled with asphalt. Sufficient asphalt was spread so as to slightly flood the surface of the blocks for about one-third their area.

When the asphalt filler had been applied, the surface was covered with clean stone chips and rolled, after which the street was open to traffic.

The engineers in charge are thoroughly pleased with the results, and the street offers an excellent thoroughfare for heavy traffic, with a minimum of noise. This street is subjected to continuous heavy haulage.

Traffic Street Plan and Boulevard System Adopted for Portland, Oregon

By Charles H. Cheney

Consultant to the Portland City Planning Commission

WITH cities all over the country studying street traffic congestion problems, definite steps to solve them, taken in any city of size, are watched with interest. Many schemes and regulations for handling traffic are being tried out, but there seems to be no permanent solution except the linking up and widening of a few conveniently located through routes, which will anchor the flow of traffic and make a sound basis for the location of business buildings, and of the stores and offices dependent on traffic for their success. Municipal officials, however, are probably as much worried about the rapidly increasing number of street accidents and the convenience of the general public as they are about stabilizing traffic for the sake of business.

Numerous cities are now, through their city planning commissions or other specially created investigating bodies, preparing comprehensive plans for relief, and setting about their execution in businesslike fashion. Detroit is opening up great cross-town arteries at considerable expense. St. Louis has a number of streets down-town in the process of widening, following the practical and comprehensive Major Traffic Street Plan completed by its City Planning Commission in 1917, and described in previous articles in THE AMERICAN CITY. The Chicago Plan and the tremendous improvements already carried out or being guided to execution by the Chicago Plan Commission are well known and are bringing enormous advantage to the development of business in that city. Many other smaller cities across the country and on the Pacific Coast have their plans, and improvements are rapidly being made to solve these difficult new traffic problems, brought upon us by the fast-increasing use of the motor vehicle.

The Major Traffic Street and Boulevard System Plan recently completed and adopted for Portland, Ore. (260,000 population), while summing up in the main the experience and practice of most of the other cities that have seriously studied the matter, contains many constructive points of interest to all cities endeavoring to solve such problems. A brief summary follows showing the conditions found and conclusions reached.

Reasons for a Major Traffic Street Plan

It is more and more evident that in the future through travel should be limited to a few conveniently located traffic streets, on which ordinary drivers once in the stream of travel can know that they are safe, and move steadily ahead, and on which reckless ones can be more easily and economically regulated.

Commercial vehicles and hauling should be limited to a few definitely established major traffic streets until they have reached the nearest point to their destination. Only thus can we furnish enough heavy traffic pavements to satisfy traffic needs, or pay the bills for their making and up-keep.

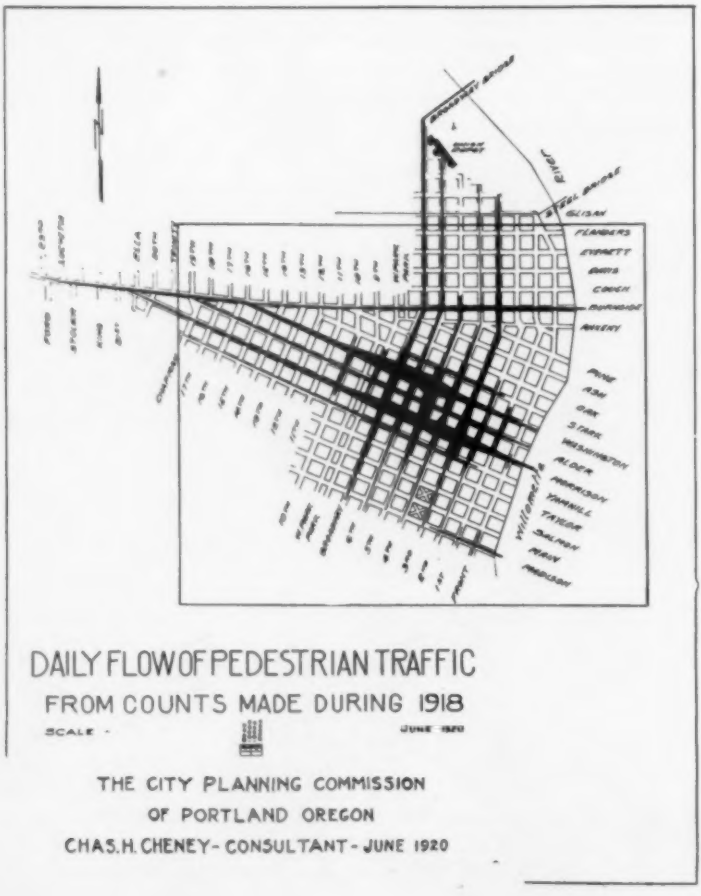
The approval of the City Planning Commission is required by state law in Portland, as in many other cities of the country, on all maps of new land subdivisions, both within the city limits or for six miles outside. In passing on the twenty-six such maps submitted to it during the last eighteen months, the Portland Commission found that it must have a general plan of major traffic streets, or through leads, for its guidance. The Major Street Plan just adopted is comprehensive and will serve to convince owners of new tracts as to the necessity of a few wide and continuous through streets laid out in advance.

The wear and tear is so great, the danger to children and pedestrians so serious, and the cost of permanent wide traffic pavements and their up-keep so large, that cities can afford to have only about every sixth or eighth street established and paved as a traffic street.

The greatest number of street accidents to-day are caused by reckless turning in or crossing at side streets. Once a compre-

hensive system of major traffic streets is settled on, all cars can be required to come to a dead stop before turning from a minor or side street into an established traffic street. Chicago already has such a system partially in effect. The Police Traffic Bureau and City Planning Commission recommend it for Portland.

The balance, or minor residence streets, comprise 85 per cent or more of our total system in most cities. For these minor streets Portland has adopted a minimum roadway of 20 feet between curbs, thereby making a saving of $112 a lot in paving cost, and it is expected that these narrow roadways will be safer, quieter, less attractive to speeders, and yet take care of all the traffic which originates or ordinarily has business on them. The Portland Commission found that millions of dollars of needless and over-wide paving has been put down on such streets in the past, and estimates that several hundred thousand dollars, at least, will be saved taxpayers in the next five years on new paving by settling now which streets will not be needed for


DAILY FLOW OF PEDESTRIAN TRAFFIC
FROM COUNTS MADE DURING 1918
THE CITY PLANNING COMMISSION
OF PORTLAND OREGON
CHAS. H. CHENEY - CONSULTANT - JUNE 1920

Streets Should Be Arranged to Suit Their Use

During the last fifteen years the coming of the fast motor vehicle with trailers carrying heavy loads amounting sometimes to as much as ten or twelve tons on two wheels has made necessary more permanent and heavy, hard surface pavement, and more direct through routes. These form the major traffic streets.

through traffic and wide pavements.

With a complete system of traffic streets decided upon, minor streets can be closed in industrial zones without question, wherever so desired for business reasons. Fewer cross-streets in residence districts would reduce the cost of land, by eliminating the land lost in such streets, and their paving cost. Portland has 200-foot-square blocks in a large part of the city, and the closing of alternate minor cross-streets is recommended. Home ownership was found to be discouraged and possibly seriously deterred by the unnecessary burden of over-wide street paving on minor streets in the past.

In paying for paving on traffic streets through valued residence districts it was recommended that the abutting residence owners be not required to pay more than they would have to if located on a minor street, a benefit district on either side and the city or county out of its general fund making up the difference.

Three Kinds of Streets Found Necessary

For economy, safety and convenience it is necessary to divide all streets into three general classes, according to their use.

1. *Major traffic streets and thoroughfares* should be located to give direct access by shortest route, carry unlimited traffic and be unobstructed as far as possible by street-car lines or railroad grade crossings. They should be not less than 80 feet in total width both within the city and leading out into the country for an average of 6 miles. In Portland some eight principal thoroughfares of 100 feet in width are recommended, and water-front hauling streets of 120 feet.

2. *Boulevards and parkways* should be indirect in route so as purposely to avoid being later appropriated as traffic routes, and should exclude commercial vehicles and truck hauling. Direct routes should be adopted only when closely paralleled by a major traffic street.

It is a well understood practice, in cities having developed boulevard systems, that all boulevards should be not less than 150 feet wide, and preferably 200 feet wide. This width is necessary to secure ample permanent parking strips for double or triple lines of trees on each side of the main roadway. Such parking and planting are what make a boulevard desirable, refreshing and useful, as distinct from ordinary or traffic streets.

Business should be prohibited by zone ordinance on all real boulevards of the permanent boulevard system.

3. *Minor residence streets*, which comprise about 85 per cent of the total in the city, should be protected from the intrusion of needless traffic, to preserve the safety, quiet and comfort of people living on them. Forty- and fifty-foot streets should be accepted where building setback lines are permanently established by the city in the future. They should be paved with 20-foot roadways or less, except where there are street-car lines.

Like most cities, Portland is already compactly built up down-town, and for a considerable distance out from the main center. Changes in streets, in these portions of the city at least, would be expensive and can only be undertaken where relief from present or future congestion makes them imperative. In the Major Traffic Street and Boulevard System plans adopted, every widening, extension or new street proposed has been carefully weighed by the City Planning Commission, as to its practical purpose and value, and only such proposals included as seem justified in cost for relief of traffic congestion.

This plan does not contemplate all these improvements at once, nor for some time to come. In fact, most of the widenings shown as ultimately necessary may be put off for one, and in some cases two, decades, if the recommendations made as urgent are put into effect reasonably soon, and always in accordance with such a predetermined plan. Establishment of 10-foot building setback lines on each side of many of the major traffic streets now only 60 feet wide will suffice for a number of years.

Benefits Expected From Adoption of a Major Traffic Street Plan

J. C. Ainsworth, President of the Portland City Planning Commission, says of the report of the Commission:

"The Major Traffic Street, Boulevard and Park System Plan will go far to solve many of the city's most serious problems.

"This plan, if adhered to, will save thousands of dollars of needless over-wide street paving by designating the 85 per cent of our streets which will not be needed as through traffic streets. It will help the small home owner by establishing definitely the minor residence streets, where the burden of paving can be cut in half. It will save more money by

Proclamation

Make 1921 a Year of Gifts to Portland

To the People of Portland:—

Let us make 1921 a year of gifts to Portland.

We are building a great city. Nature has endowed us with greater scenic gifts than are possessed by any other large city of our country. To make our city now as accessible, useful and beautiful as it should be is a task which commands the best efforts of every citizen.

Automobile tourists and travelers are just discovering Portland. Splendid state highways are nearing completion. Our Portland traffic ways and boulevards should be linked up with them without delay. We need more base-ball grounds, and larger playgrounds at our schools. Every child, and adult, too, anywhere in Portland should have full opportunity for healthy recreation. We need large, wild parks, and more mountain parks. We must depend upon the generosity of our citizens to save such spots and present them to Portland before the desired tracts are broken up or built upon.

In the past we have had some splendid benefactions. The man of modest means who gave us the beautiful ten acre Shepherd's Dell Park, on the Columbia River Highway, did no less a permanent public service than he who gave us for all time the wonderful Multnomah and Wahkenah Falls, with their 740 acres of Park, or Terwilliger Boulevard, or the beautiful fountain at Second and Ankeny Streets.

The City Planning Commission for two years has been carefully listing the city's needs, and with the help of the Advisory Park Board has perfected a general boulevard and park system plan which should be completed as fast as possible. All citizens who will participate in the campaign are requested to get in touch with the Commission's office, Room 424, City Hall, and see what the needs are. Gifts to the city should be outright, without restrictions.

I ask civic organizations to name committees to seek gifts for the city in cooperation with this Commission. At the end of the year public acknowledgment will be made to the organization bringing in what, in the opinion of the City Planning Commission and Advisory Park Board, is the most important gift to Portland in 1921.

Portland today is entering its greatest and most important era. The recent order granting justice, so long denied the city, in freight rates to and from the Inland Empire, inauguration of the world port program authorized by the city and the legislature, the location of many new industries here, and other constructive steps being taken by city, county, and state, including plans for the 1925 Exposition in this city, bring promise of equally increased prosperity and responsibilities to all.

Let us now do these generous and public spirited things, for which the city must wait many years unless it has unusual aid from its citizens.

February 23, 1921. *GEO. L. BAKER, Mayor.*

[redacted]

RESOLUTION OF THE CITY COUNCIL

Whereas, Portland has had in the past some splendid public gifts, that reflect great permanent credit, both upon the donors and the city, and

Whereas, we are now confronted with the need of many playgrounds, parks, boulevards and traffic streets, which there are no public funds available to purchase, and

Whereas, a committee of public spirited citizens working with the City Planning Commission and Advisory Park Board propose to make these needs known to the people of the city, in a campaign during 1921, now therefore be it

Resolved that the City Council of the City of Portland, hereby gives its hearty approval and endorsement to this campaign to "make 1921 a year of gifts to Portland" and promise our hearty cooperation, it being understood that final acceptance of any gifts by the city shall be preceded by full consideration of the Council. We are confident that this great civic effort is conceived in a spirit to put Portland ahead and to make it the most convenient, comfortable and attractive city on the Pacific Coast, and we bespeak the assistance of all citizens and civic organizations in carrying it through to the greatest possible successful conclusion.

Adopted by the City Council of the City of Portland, February 23, 1921.

Ayes—Commissioners Baker, Barbur, Bigelow and Pier.

Noes—None. *Absent*—Commissioner Mann.

GEO. R. FUNK, *Auditor.*

By W. D. Smith, *Deputy.*

AN INSPIRING APPEAL TO CITIZENS OF PORTLAND, ORE.

From ancient times, public-spirited citizens have found satisfaction in offering gifts to their native cities. No form of memorial secures more lasting appreciation

stabilizing the down-town centers of traffic, thereby preventing unwarranted shifting of the retail center, with consequent depreciation and loss, while allowing for reasonable expansion of the business district in all directions.

"It will save time for everyone, by relieving traffic congestion in all parts of the city. It will increase safety on our streets and should reduce street accidents by half, by establishing traffic streets at which a dead stop of all cars turning in from side streets can be required, as in some eastern cities.

"It provides a system of boulevards passing all the principal points of interest in the city and making the most of Portland's scenic attractions. The linked-up system of highways, city and mountain drives provided will attract tourists from all parts of the United States. The carefully selected locations for playgrounds and parks will save thousands of dollars to the city and the school board by eliminating duplications in playground and field house facilities.

"A comprehensive and practical plan of development is provided for us all to work to, so that investors may know where traffic is going and build accordingly."

Portland City Plan Brings in Gifts

Upon the completion of the major traffic street and boulevards and park system plan for Portland, and its adoption by the City Planning Commission and the Park Board, it was evident that many of the new through routes would increase adjoining property values and were of such importance to large property owners particularly that they could well afford to make large donations to the city. There were many small property owners also who, both through civic pride and a desire for more wide main roads, were willing to give extra widths of roadway along the front of their lots to help the city.

In order to do as much for the city as possible without cost, and to prove that city planning pays, the Commission asked the Mayor to issue the proclamation reproduced on the opposite page. This was done February 26, 1921, and the City Planning Commission organized committees in all the principal civic bodies to see which would bring in the most notable gifts for Portland during the year.

While no public announcement of the exact gifts so far offered the city has been made, the Commission has taken the Mayor and Council to see the first fifteen pieces of property offered up to May 1, and deeds are now being prepared for over 27,000 lineal feet of new traffic ways, boulevards and parkways, none of which are less than 100 feet in width and most of which are 150 and 200 feet in width.

Before the end of the year the Commission expects to receive and file deeds with the city for several times this amount of new boulevards, parkways and much-needed traffic streets.

On the Calendar of Conventions

JULY 3-8.—DES MOINES, IOWA.
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1400 Massachusetts Avenue, N. W., Washington, D. C.

JULY 11-13.—AUSTIN, TEX.
Texas Commercial Executives' Association. Annual meeting. Secretary, F. N. Clifford, Yoakum, Tex.

JULY 17-31.—EVANSTON, ILL.
National School for Commercial Secretaries. Address Northwestern University, Evanston, Ill.

JULY 21-23.—OAKLAND, CALIF.
American Physical Education Association. Annual convention. Secretary, Dr. J. H. McCurdy, 93 Westford Avenue, Springfield, Mass.

AUGUST 1-8.—PALO ALTO, CALIF.
Western Summer School of Community Leadership. Address Charles A. Simmons, Western Manager, American City Bureau, Merchants' Exchange Building, San Francisco, Calif.

AUGUST 9-12.—THREE RIVERS, QUEBEC.
Dominion Association of Fire Chiefs. Annual convention. Secretary, James Armstrong, Kingston, Ontario.

AUGUST 10-12.—CHICAGO, ILL.
International Association of Street Cleaning Officials. Annual conference. Secretary, A. M. Anderson, 1340 Old Colony Building, Chicago, Ill.

AUGUST 15-26.—MADISON, WIS.
Summer School of Community Leadership. Address Ralph G. Stoddard, Business Manager, American City Bureau, Tribune Building, New York, N. Y.

AUGUST 16-18.—SIOUX CITY, IOWA.
League of Iowa Municipalities. Annual meeting. Secretary, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 21-28.—CHAUTAUQUA, N. Y.
Open Forum National Council. Annual meeting. Secretary, Robert S. Holmes, Daytona Beach, Fla.

AUGUST 23-25—DETROIT, MICH.
American Association of Park Superintendents. Annual meeting. Secretary, Emmett P. Griffin, Superintendent of Parks, East St. Louis, Ill.

AUGUST 23-25.—BUTLER, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

SEPTEMBER 6-8.—CINCINNATI, OHIO.
American Society of Sanitary Engineering. Annual convention. Secretary, Aden E. Smith, care of Board of Health, Cincinnati, Ohio.

SEPTEMBER 13-15.—DETROIT, MICH.
Association of American Cemetery Superintendents. Annual meeting. Secretary, W. B. Jones, Highwood Cemetery, Pittsburgh, Pa.

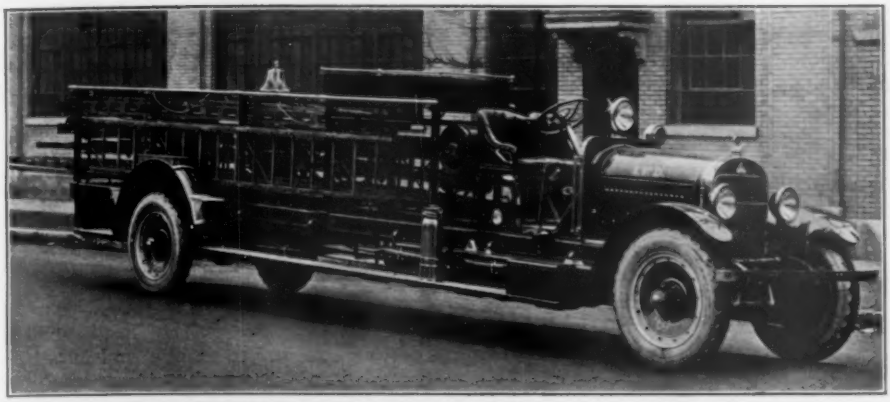
SEPTEMBER 13-16.—BRIDGEPORT, CONN.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 26.—BOSTON, MASS.
National Safety Council. Annual Safety Congress. Secretary, S. J. Williams, 168 North Michigan Avenue, Chicago, Ill.

Progressive American Cities Seek Full Motorization of Municipal Departments

HARLEY-DAVIDSON MOTOR-CYCLES ARE A PART OF THE EQUIPMENT OF THE MILWAUKEE, WIS., FIRE DEPARTMENT. CARRYING A NUMBER OF HAND EXTINGUISHERS, THEY CAN REACH A FIRE MINUTES AHEAD OF THE OTHER APPARATUS, AND HAVE PROVED VERY EFFECTIVE

AMERICAN-LA FRANCE HOOK AND LADDER OWNED BY THE FAME FIRE COMPANY, WEST CHESTER, PA.



A STUTZ HOOK AND LADDER TRUCK WITH FIELD EQUIPMENT

A LARRABEE-DEVO TRUCK WITH A TRAIN OF TROY TRAILERS IN USE IN BINGHAMTON, N. Y.

THIS 3½-TON FEDERAL IS THE "JACK OF ALL TRADES" OF THE LACONIA, N. H., STREET DEPARTMENT

The truck is called upon to haul and spread gravel and stone, and is here shown pulling out a boulder

Methods of Financing Municipal Street Lighting

By H. L. Dollahan

WHEN a city begins to plan a White Way installation, the financing of the installation is the first problem that must be solved. There are several plans that have been used in the financing of such city improvements.

Popular Subscription Method

Generally, local conditions must be considered in choosing the best way to finance an installation. A method that is more or less popular in the South is to raise the money by a subscription among the property owners, the city occasionally contributing a certain amount out of its general funds. However, if care is not taken in the use of this method, the scheme is apt to fall through. It should be pushed through and closed while every one is interested in the matter.

To successfully put this matter of financing across, the business-building value of a White Way must be impressed upon the local merchants. Talk about the advantages of better street lighting in the local newspapers, have posters featuring the new lighting printed and distributed, and have street lighting specialists give talks before the various civic organizations and commercial clubs. Also call upon each merchant that has a store on the street to be lighted and talk better street lighting to him.

When enthusiasm is at its height, have representative citizens take out subscription lists—preferably two or three men in each block. It is sometimes best not to ask the merchant for any specific amount, but rather to pledge his support. The petition or subscription list should be headed with the name of the town, the street to be illuminated, and, if possible, the number of feet abutting on the improvement district, as follows:

"We, the undersigned citizens (property owners) of Progress City, Texas, do hereby pledge ourselves to pay for a White Way to be installed on Main Street between Clark Street and First Avenue, it being understood that our share will not be more than three dollars ($3.00) per front foot of property owned or occupied by us and fronting on Main Street between Clark Street and First Avenue."

Financing by the Central Station

Another method of financing which has been popular in certain localities is for the lighting company to furnish and install all material and charge the city a stipulated rate for current and maintenance, which would include interest on the investment and depreciation. This method is especially popular in the state of Michigan, where the state law does not recognize street lighting as a permanent improvement.

Probably the most common method of financing White Way improvements in such states as Illinois, Indiana, Wisconsin, Minnesota, Montana, and all other states in which the public improvement law pertaining to street paving and sewer systems is applicable to White Way installations, is to assess the property abutting on the street in which the lighting system has been installed for the full cost of the improvement.

Some states, like Illinois, assess on a front-foot basis. Wisconsin assesses on the valuation of the property. In Ohio, a municipality may install a White Way system on any public street upon the petition of owners of adjacent land with a valuation amounting to three-fourths of that of all the property affected, and special assessments may be levied upon such owners for a part or all of the cost. The assessments so levied may be collected in one or more instalments in the manner provided in the case of assessments for street improvements, and the legislative body may levy and provide for the collection of such assessments at any time before or after the completion of the lighting system. Any such assessing ordinance may be made to include the property specially benefited by such lighting system, and may also include property abutting upon any one or more streets or public places, or parts thereof, which are lighted by it.

In other states, such as Michigan, in which the city charter does not recognize

White Way lighting as a permanent improvement, if the installation is not financed by the lighting company, the city is compelled to install the system out of the general fund. Indiana handles such matters in practically the same way as Illinois, except that ornamental lighting can be installed only on streets which are paved and where at least 50 per cent of the lots or parcels of land on the blocks on which the lamps are to be installed are occupied by buildings used either for business or residential purposes.

Seventy-five per cent of the owners of such real estate abutting on the improvement district as set forth above are required to sign a petition for the lighting improvement, and in no event is the lighting system to be installed where the cost exceeds 20 per cent of the assessed value of the lots. The assessments covering this cost are payable in two annual installments after the system is installed.

Securing White Ways by State Laws

In states where they recognize White Way installations as coming under the public improvement laws, there are two methods of properly presenting the subject before the city council, or the commission form of government.

The first method is for the property owner to sign and present a petition to the board of local improvements, the number of the signatures required by the various states varying from 50 to 75 per cent. Such a petition would request the board of local improvements to create a lighting district, draw up plans and specifications, as well as estimate the cost of the work and call for a public hearing. Naturally, there will be little protest at a public hearing, since the petitioners have asked for the improvement. The board of local improvements after the hearing instructs the city attorney to draw up an ordinance and the engineer to prepare his plans and specifications for the installation, certified copies of which are placed on file with the county judge, who must authorize the assessment spread and give authority for collecting it. The city council then passes the ordinance creating this improvement district and issues the call for bids.

The other method is the same as explained above, except that the board of local improvements can create at its option a lighting district without a petition's being presented, but frequently the objections given at the time of the public hearing are enough to counteract or forestall the improvement, at least for the time being.

Methods of Financing Adopted by Various Cities

Following are the methods adopted by several cities in various parts of the country for solving their financing problems:

Albert Lea, Minn.—Original installation purchased and installed by the lighting company, a higher rate being charged to compensate for the investment. The cost of current included in higher rate is paid by the city out of general fund.

Duluth, Minn.; Charleston, W. Va.—Merchants paid cost of lamps and fixtures. Electric light company paid for rectifier, globes and wire. City pays for operation.

Huntington, W. Va.—Property owners pay for entire installation. City buys current and pays for operation.

Gastonia, N. C.—Municipal plant. City pays for all.

Wilmington, N. C.—Light company installed complete. City pays for up-keep and current.

Greenville, S. C.—Light company installed complete system. City pays for operation.

Shelby, N. C.—Municipal plant. City installed and operates it.

Raleigh, N. C.—City paid for poles and hardware. Light company furnished lamps, rectifiers. City pays for current.

Bellefonte, Pa.—Light company installed system, furnishing lamps and rectifiers. City furnished other equipment and pays for maintenance.

Allentown, Pa.—Light company installed. City pays for current.

Cumberland, Md.—City pays for installation and maintenance.

Wilmington, Del.—Light company installed. City maintains and operates.

Philadelphia, Pa.—Light company installed. City maintains and operates.

Easton, Pa.—Municipal light plant. City installed and maintains.

Baltimore, Md.—Light company installed. City maintains.

Washington, D. C.—Light company installed. City maintains.

Bridgeton, N. J.—Light company installed. City maintains.

Ironton, Minn.—Original installation purchased out of general city funds. Cost of current and maintenance paid by city from general fund.

Dell Rapids, S. Dak.—Handled same as Ironton, Minn.

Fergus Falls, Minn.; St. James, Minn.; St. Paul, Minn.; Livingston, Mont.—Original installation is assessed against the property owners abutting on the improved district, and the cost of maintenance is paid for by the city out of its general funds.

King Standards
are a
Quality Product
King standards equipped with General Electric Novalux fixtures represent the highest ideals of quality, beauty, permanence and usefulness.
Our engineering department is at your disposal.
KING MANUFACTURING CO.
53 West Jackson Blvd.
CHICAGO, ILL.

Municipal Finance

BONDING **ACCOUNTING** **TAXATION**

Uniform Accounting Classification for Illinois Cities

By Lloyd Morey, C. P. A.
Comptroller, University of Illinois

A COMMITTEE of financial officers from various Illinois cities has been at work for some time under the Illinois Municipal League endeavoring to develop a uniform classification of accounts for Illinois cities. Illinois has no laws requiring uniform accounting methods in cities, or uniform reports. Development along this line, therefore, has been somewhat retarded. The Illinois Municipal League hopes to secure the establishment of uniform systems of accounts and reports through the activities of its special committee. The members of the committee are J. J. Crowder, Comptroller, Peoria; M. T. Rudgren, Commissioner of Finance and Accounts, Rock Island; Frank Wynkoop, Comptroller, Springfield, and Lloyd Morey, Comptroller, University of Illinois, Chairman.

The first report of the committee was presented at the annual meeting of the League in Springfield on February 2 and 3. The report dealt with classification of receipts and expenditures. Further studies of the committee will be directed toward uniformity in balance sheets and in accounting forms.

The report of the committee as presented in February was adopted by the League, and is as follows:

General Classification Outline

(1) Receipts
  A. As to *source* (Schedule I)
  B. As to *fund*, following the ordinances and practice of each respective city
(2) Expenditures
  A. As to *departments* (Schedule II)
  B. As to *fund*, following the ordinances and practice of each respective city
  C. As to *service* and commodity, such as salaries, wages, supplies and materials, equipment, etc. (each department is to be analyzed as its expenditures may require)

Schedule I

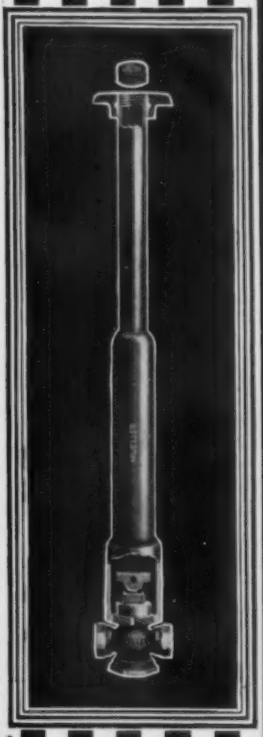
Classification of Receipts

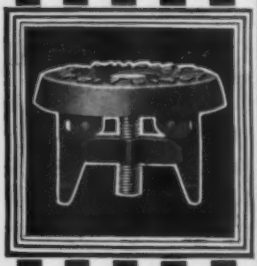
I. Revenue Receipts (divide each of the following items, as necessary)
  A. General Taxes
  B. Special Taxes (not including special assessments (see II B) or pension funds (see II D)
  C. Licenses, franchises, and privileges
  D. Fines
  E. Departmental earnings (not including municipal utilities—see II C)
  F. Miscellaneous
II. Non-Revenue Receipts
  A. Receipts from loans, anticipation warrants, bonds, etc.
  B. Receipts from special assessments (itemize)
  C. Receipts of public service enterprises (municipal utilities—separate account for each)
  D. Trust and special funds, including only pension funds, sinking funds, and the like

Schedule II

Classification of Expenditures

I. Expense and Interest
  A. Corporate expense (salaries, materials, and miscellaneous, but not including equipment) (see II B)
    1. General Government (public affairs, and accounts and finance)
      a. Mayor (salary and office expense)
      b. Council or Commissioners (salaries, printing, etc.)
      c. Legal Department (salaries and office expense)
      d. Comptroller (salary and office expense)
      e. City Clerk (salary and office expense)
      f. Treasurer (salary and office expense)
      g. Election expenses (including expenses of election commission)





MUELLER
Improved Extension Service Boxes

This MUELLER improvement over the old type screw adjustment box, permits the raising or lowering of the upper section without injury to the curb cock or service.

The large case insures stability — the lid is practically indestructible—yet the materials used give excess strength coupled with lighter weight—effecting a decided saving in freight.

Made with 1¼", 1½" and 2" upper sections, they will accommodate a range of water or gas curb cocks from ½" to 2", as desired.

MUELLER Service Box Repair Lids are easily attached, and when applied make the old box better than it was originally. Many new boxes are now ordered equipped with MUELLER Repair Lids.

Write for full description and prices.

Mail orders given prompt attention.

H. MUELLER MFG. CO., Decatur, Ill.

PHONE BELL 153

Water, Plumbing and Gas Brass Goods and Tools

New York City, 145 W. 30th Street
Phone Watkins 5397

San Francisco, 635 Mission Street
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Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.

h. Judicial Departments (Police Court or other courts)
i. Civil Service Commission
j. Contingencies
2. Public Health, Safety, and Sanitation
a. Police Department
b. Fire Department
(1) Salaries
(2) Materials and supplies
(3) Fire alarm system
c. Inspections (building, electrical, plumbing, milk, etc.)
d. Health Department
e. Garbage
f. Hospitals and Sanitariums
3. Public Works and Property
a. Engineer
b. Board of local improvements
c. Streets and subways
(1) Cleaning
(2) Repairs
(3) Sprinkling
(4) Oiling
d. Sidewalks
e. Sewers and drainage
f. Bridges, wharves, and waterways
g. Street lighting
h. Public buildings
i. Scales
j. Cemetery
4. Parks and Playgrounds
5. Libraries
B. Interest and Redemption of debt (including payments out of corporate revenue for interest on indebtedness and redemption of debts, and contributions to sinking fund)

II. Capital Outlays
A. From corporate revenue (see I A)
1. Departmental (by departments)
2. Public benefits for local improvements (itemize)
B. From general bond issues (itemize)
C. From special assessment funds (including redemption of bonds out of these funds) (itemize)
D. From receipts of public service enterprises (III)

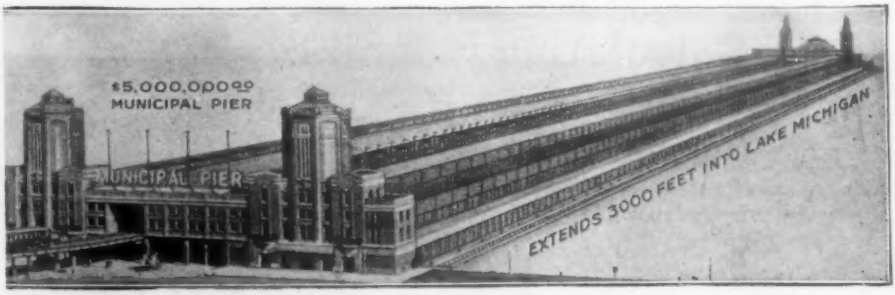
III. Public Service Enterprises (municipal utilities)
A. Water-works (analyze as necessary)
B. Electric light plant (analyze as necessary)

IV. Trust and Special Funds
A. Police pension fund
B. Fireman pension fund
C. Sinking funds

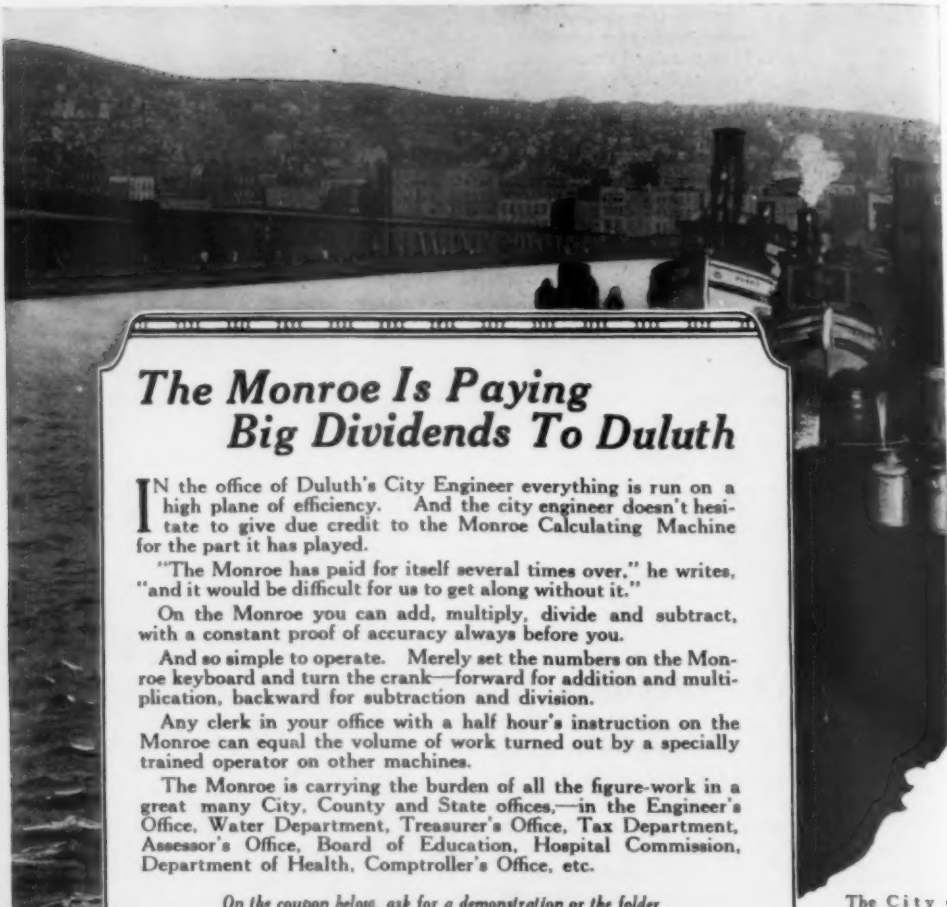
Chicago's Exposition Will Help to Revive Industry

CHICAGO has taken the lead in bringing every encouragement in her power to bear upon the revival of industry. From July 30 to August 14 there will be held on the Municipal Pier probably the most remarkable industrial and educational exposition ever presented in this country.

In addition to commercial displays, both domestic and foreign, there will be others of distinct municipal interest. The Health and Sanitation Exhibition given at the Coliseum last November will be repeated. Nor will the important fact of public safety be overlooked. There will be complete displays of fire-fighting apparatus and several exhibits showing how accidents in industry have been reduced 60 per cent since 1912. An exhibit of public utilities will be especially interesting, showing how gas, water-heat from central plants, and other commodities have replaced the tallow candle, the old oaken bucket, and the wood-pile.



CHICAGO'S MUNICIPAL PIER IS AN IDEAL LOCATION FOR A SUMMER EXPOSITION



The City of Duluth, Minn., in the background.

The Monroe Is Paying Big Dividends To Duluth

IN the office of Duluth's City Engineer everything is run on a high plane of efficiency. And the city engineer doesn't hesitate to give due credit to the Monroe Calculating Machine for the part it has played.

"The Monroe has paid for itself several times over," he writes, "and it would be difficult for us to get along without it."

On the Monroe you can add, multiply, divide and subtract, with a constant proof of accuracy always before you.

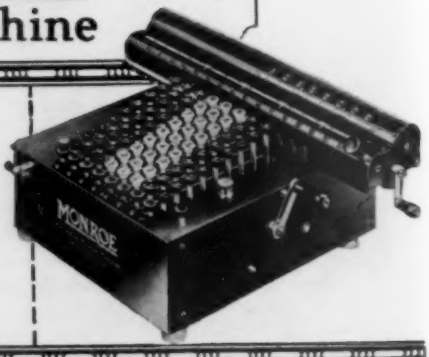
And so simple to operate. Merely set the numbers on the Monroe keyboard and turn the crank—forward for addition and multiplication, backward for subtraction and division.

Any clerk in your office with a half hour's instruction on the Monroe can equal the volume of work turned out by a specially trained operator on other machines.

The Monroe is carrying the burden of all the figure-work in a great many City, County and State offices,—in the Engineer's Office, Water Department, Treasurer's Office, Tax Department, Assessor's Office, Board of Education, Hospital Commission, Department of Health, Comptroller's Office, etc.

On the coupon below, ask for a demonstration or the folder "How New York State Saved $85,000."

MONROE
Calculating Machine



MAIL THE COUPON, *NOW*

Monroe Calculating Machine Co., Woolworth Bldg., New York.
Without obligation (check items desired)

[ ] Arrange for a demonstration in our office on our own work.
[ ] Send us folder, "How the State of New York Saved $85,000."

Department .....
My Name ..... Title .....
Address .....

AC-7-21

Chamber of Commerce Activities in Public Affairs

Summer Schools During July and August

Secretaries of chambers of commerce and others interested in community leadership will have ample opportunity during July and August to gain information and inspiration for their fall and winter tasks.

A special one-week course in community leadership will be conducted jointly by the American City Bureau and the University of Oklahoma at Norman, Okla., July 11 to 16, and a similar course will be conducted the following week in coöperation with the University of Colorado, Boulder, Colo.

From July 17 to 31 will be held a "National School for Commercial Secretaries" at Northwestern University, Evanston, Ill., under the auspices of the Chamber of Commerce of the United States, the National Association of Commercial Organization Secretaries, and Northwestern University.

A Western Summer School of Community Leadership will be conducted by the American City Bureau at Stanford University, Palo Alto, Calif., August 1 to 6; and the big annual Summer School of the American City Bureau will be held this year, as last, at the University of Wisconsin, Madison, Wis., August 15 to 26.

Chamber Suggests Improvements for City Departments

TOLEDO, OHIO.—The report recently submitted to the Mayor, civic organizations and general public of Toledo, dealing with the expenditures of the city government and the degree of efficiency secured in the operation of the municipal departments, came as the result of an investigation determined upon at a meeting held in the office of the Mayor on November 22, 1920. The meeting was called by the Mayor after certain criticisms had been made by some of the luncheon clubs, calling attention to the large expenditures of the municipality and voicing their dissatisfaction with the manner in which a number, at least, of the departments of the city were being operated.

The following civic organizations were represented at the meeting: The Toledo Chamber of Commerce, Rotary Club, Central Labor Union, Exchange Club, Kiwanis Club, Lions Club and Ad Club. After considerable discussion it was decided unanimously by those present that an investigation of municipal government conditions in Toledo be ordered, and the Mayor drew a resolution providing for the appointment of the Director of the Public Service Bureau of The Toledo Chamber of Commerce to conduct the investigation and make a report to the officials and general public of Toledo.

The report recently submitted is the result of the investigation which has been made in the meantime. The entire cost of the investigation was borne by The Toledo Chamber of Commerce. The report when completed was presented to a committee of four prominent citizens, who unanimously endorsed it. It was also approved unanimously by the President and Board of Trustees of The Toledo Chamber of Commerce.

The report goes into considerable detail with regard to the practical operation of most of the municipal departments, gives comparative figures of costs covering a period of years, makes many criticisms of conditions which call for the application of remedies, and makes recommendations (thirty-two in number), with the reasons for their advocacy.

Every effort was made in presenting the report to avoid the confusion too often consequent in the public mind on the presentation of reports containing a large and complicated mass of figures, the figures used in the report being presented only where necessary to give the general public an adequate idea of actual conditions, and to drive home its salient features. The findings of the report included thirty-two specific recommendations, of which a few are given on page 63.

Expert Engineering Advice
on all Playground Installations

The Medart Plan and Engineering Department is constantly adding to its 50 years of accumulated experience by devising and planning playgrounds so that the greatest good will follow through their use. Add to this an honest effort to plan every installation, no matter what its size, so that the maximum benefits are obtained at the minimum cost—and the result is a service which under no circumstances you can afford to be without.

No Cost or Obligation

Medart Engineering Service is given without cost or obligation of any kind whatever. It is a service of which you should avail yourself regardless of wh your playground problem may be Whether your plan is extensive or limited, you will always find it decidedly to your advantage to get the full benefit of our experience.

Send for Catalog L

Send for our Catalog L. It is perhaps one of the most complete treatises available and is recognized everywhere as a text book on modern playground planning. When you send for it please outline in brief just what your problem is—you will have our earnest and intelligent co-operation.

FRED MEDART MFG. CO.

Potomac and DeKalb Sts. — St. Louis, Mo.

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MEDART

The two evening papers in Toledo gave the report splendid support in publicity. This coöperation on the part of the press proved of great assistance in getting the report into the homes of the citizens, where they had an opportunity to read and thoroughly digest it.

The real value of a report of this nature lies in the influence it exerts in forming, moulding and energizing public opinion. Every effort was made to present the report in language and form to attract and hold the attention of the average citizen, and from the general interest manifested in the community there is every reason to believe that this result has been secured.

The Mayor has already taken steps to put into practical effect some of the changes suggested. A reorganization of the Division of Streets is now being planned, which will undoubtedly result in securing economies and rendering a more satisfactory service.

The importance of following up a report of this kind containing so many recommendations and suggestions is readily apparent.

It is the purpose of the Chamber of Commerce—if persistence and patience can accomplish anything—to secure for the community the benefits that it is clearly apparent can be secured from the carrying out of the recommendations made in the report.

J. R. COWELL,
Director, Public Service Bureau, The Toledo Chamber of Commerce.

Some Specific Recommendations of the Toledo Chamber

A strict compliance with the requirements of the charter regarding the preparation of the annual budget.

A careful study by officials and citizens of the merits of the city manager plan, and an opportunity afforded the voters, after reasonable consideration, to pass upon its adoption.

That the minimum service requirements before men in the divisions of fire and police are entitled to pensions be changed from twenty-five to thirty years.

That the fees charged in the division of inspection for certain services be raised to cover the cost of such service.

That the possible advantage to the city by the use of automatic street cleaning equipment be thoroughly enquired into.

That the funds of the water division be kept separate from those of other departments, and that this municipal utility receive credit for all interest received on surplus funds held in banks.

That a central city garage be put in operation, with a thorough record system showing cost of operation and maintenance of each machine, and that the water division be relieved of this burden.

That the work of the division of health be extended to cover more completely a service to the public along educational and preventive lines, under a public health official with special fitness and training, who will give his whole time and energy to the duties of the office.

Chamber of Commerce Investigation Reduces Paving Costs

LOWELL, MASS.—Granite block paving done by the city has cost Lowell approximately $10 per square yard. The Chamber of Commerce investigated the situation and got information to show the city government that similar paving could be done by contract, using Lowell labor, for $4.75 per square yard, about half the price paid in 1920. Better work by contract was guaranteed also.

The Chamber made recommendations on this investigation to the City Council, and now plans to continue the agitation until paving costs are reduced. Under local circumstances the amount of paving could be doubled and twice the number of laborers could be employed by contract work. Lowell needs street construction, but the city cannot pay $10 per square yard for it.

During the last month the Chamber also advised the City Purchasing Agent to buy cement on a guarantee price basis to guard against unstable market conditions for that commodity.

EDWARD W. GALLAGHER,
Assistant Secretary, Lowell Chamber of Commerce.

Close Relations Between Chamber of Commerce and High School

ATTLEBORO, MASS.—The Chamber of Commerce of this city has been actively endeavoring to create a definite interest in the community on the part of the younger people, and believes that one of the best

HOLOPHANE
ILLUMINATION SERV C:

Does Your Street Lighting Provide These Advantages?

1st—Safety from collision
2nd—Safety from attack
3rd—Safety from burglars
4th—Convenience in recognizing passers-by
5th—Convenience in avoiding obstacles
6th—Last but not least—Economy.

If it does not provide these things, then you do not have good street lighting.

BE sure the equipment you buy has the name Holophane stamped on the glass, showing it is made by the Holophane Glass Company. Genuine Holophane Street-Lighting Refractors are of two-piece, dust-proof construction, and control the light by means of scientifically designed prisms. Beware of singlepiece imitations that embody mere corrugations, not scientifically calculated prisms.

A lighting engineer will gladly confer with you about improving your street lighting if you will write to the General Electric Co., Schenectady, N. Y., or branches; The Westinghouse Electric & Manufacturing Co. (Geo. Cutter Works), South Bend, Ind., or branches; the Line Material Co., South Milwaukee, Wisconsin;

or

HOLOPHANE GLASS CO.

342 Madison Ave. (Dept. F-22) N. Y. C.

Works, Newark, Ohio

Recognized Leaders in the Science of Light Control

Send for the book, The New Era In Street Lighting.

ways to stimulate coöperation between the Chamber of Commerce and the school population is by some act which will incite ambition in school work.

After considerable study, a committee of the Chamber of Commerce came to the conclusion that a most appropriate inspiration to the students would be a bronze tablet on which would be inscribed annually the name of the High School student attaining the highest scholastic standing during the four years of his course. Such a tablet has therefore been prepared and presented to the High School by the Chamber of Commerce. It has been placed in the lobby of the school, squarely in front of the main entrance, where every student will see it every day of his school years—a constant reminder of the Chamber of Commerce.

A DAILY REMINDER TO ATTLEBORO STUDENTS OF THE INTEREST OF THE CHAMBER OF COMMERCE IN EDUCATION

In return, each year the senior class is expected to prepare essays on some community topic. While this activity is separate from the presentation of the tablet, it is nevertheless closely associated with the idea. The tablet should be a special help to the High School freshmen, laying emphasis as it does upon the present-day tendency not to realize the real purpose of High School work until too late in the course of education. As a further inspiration and evidence of this spirit of coöperation between the Chamber of Commerce and the High School, a meeting of all High School students was held in the High School auditorium, at which time the Mayor and the Municipal Council, the Municipal School Committee, the officers and directors of the Attleboro Chamber—good examples of grown-up high school students—were present for the purpose of presenting the bronze tablet to the High School. The Mayor, the President of the Chamber, the Superintendent of Schools, and the principal of the High School inspired the student body through brief addresses.

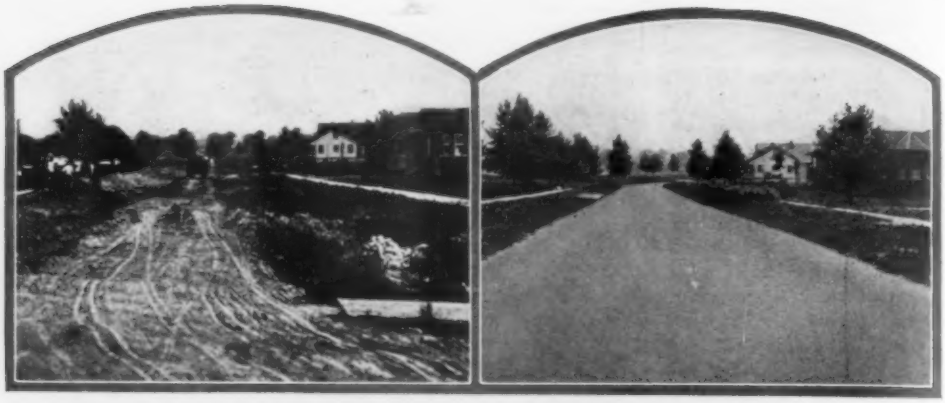
WALTER O. LOCHNER,
Secretary, Attleboro Chamber of Commerce.

Coöperating for Public Health

WATERBURY, CONN.—Realizing the value of greater coördination between the private health agencies and the municipal health department, the Waterbury Chamber of Commerce has finally presented a plan for coördinating the various agencies engaged in health activities in the city. With this in mind, a communication was sent to other American cities, principally the larger ones, which had so-called associations of social agencies. While nothing was found which compared exactly with the plans finally adopted for the Waterbury Public Health Council, the idea of coördination, and the value of it, were apparent from the success of other agencies. A definite plan for the Waterbury Public Health Council was then presented by Secretary Moore to his Board of Directors.

The plan is designed to promote greater coöperation and understanding among the various organizations engaged in and interested in problems of public health. It will prevent overlapping in the solution of these problems, foster the discussion in conference of the health problems of the cities, stimulate the interest of the public, and secure further public coöperation in these vital matters. It will provide a clearing-house for health information, and an organization that can function in an emergency.

This Public Health Council consists of representatives of the existing agencies of



Wretched condition of Kenilworth Avenue, Villa Park, Ill., **before** *the use of Tarvia*

Picture of same section **after** *being constructed with "Tarvia-X" Note excellent condition of road today*

Good Roads Boost Property Values—

YOU can easily see how Tarvia has improved property values along Kenilworth Avenue, Villa Park, a pretty suburb of Chicago, Ill.

Here was a stretch of road that was bumpy and "hard going" on even the best of days, while during the Spring thaw and after a heavy rain it was practically impossible to navigate.

That was its condition before the road authorities of Villa Park turned to Tarvia. Tarvia will make this road last for years. With but occasional inexpensive treatments with "Tarvia-B" as the traffic demands it, it will always be free from mud and dust, waterproof, frost-proof and traffic-proof. It has increased the desirability of the abutting property many hundred per cent.

For these reasons Tarvia streets have the hearty approval of taxpayers everywhere. The story of Kenilworth Avenue is being repeated in many cities and towns all over the country.

Tarvia is a coal-tar preparation for use in constructing new roads or repairing old ones. One Tarvia road in your community will prove to you and your townspeople how Tarvia roads increase property values and decrease taxes.

Illustrated booklet telling about the various Tarvia treatments free on request.

Tarvia

For Road Construction Repair and Maintenance

Special Service Department

This company has a corps of trained engineers and chemists who have given years of study to modern road problems. The advice of these men may be had for the asking by any one interested. If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will be given prompt attention.

New York, Chicago, Philadelphia, Boston, Detroit, New Orleans, Birmingham, Kansas City, Salt Lake City, Seattle, Peoria, Atlanta, Johnstown, Lebanon, Youngstown, Toledo, Elizabeth, Buffalo, Baltimore, Omaha

The Barrett Company

St. Louis, Minneapolis, Duluth, Columbus, Jacksonville, Cleveland, Dallas, Milwaukee, Richmond, Houston, Cincinnati, Nashville, Bangor, Latrobe, Denver, Pittsburgh, Syracuse, Washington, Bethlehem

THE BARRETT COMPANY, Limited: Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S.

a public nature interested in public health work. Such agencies include, among others, the Chamber of Commerce, the Board of Health, the Associated Charities, the Rotary Club, the schools, both private and parochial, the Red Cross, and the various hospitals of the city.

The Directors of the Waterbury Chamber of Commerce authorized the Secretary to call a meeting of the social and health agencies of the city and present the plan to them. The meeting was held, and a temporary organization was started, which has now been made permanent and is already operating with marked success.

THOMAS F. MOORE,
Secretary, Waterbury Chamber of Commerce.

Chamber of Commerce Helps Finance Home Building

MORGANTOWN, W. VA.—During the week of May 16, Morgantown experienced perhaps one of the most unique campaigns or drives in the history of any town. It was a thrift week campaign, sponsored and handled by the Morgantown Chamber of Commerce, of which Major Charles C. Robinson is president. During this week members of the Chamber of Commerce put aside their private business and canvassed the city and the general community about Morgantown in the interest of new stock subscriptions for the eight building and loan associations that are doing business in that city.

These associations needed more money to carry on their work and to meet the demands made upon them for funds with which to build houses. The result was that a large number of shares of stock wree written in the names of business men, craftsmen, University instructors, and students in the State University located at Morgantown and in the Morgantown High School. These associations had loaned $585,000, largely on homes, since January 1, 1921, and money had become unusually "tight." Various committees were appointed by the Chamber of Commerce to handle the different districts, and the slogan was "Save Morgantown by Saving for Yourself."

As a result of the campaign it is expected that a still greater impetus will be given to building operations in that city and vicinity. It is conservatively stated by consulting engineers, architects and contractors that there are as many new homes contemplated in the remaining months of the building season as are now under construction. This demonstrates the effectiveness of the Chamber's work.

A recent survey made for the Chamber of Commerce showed that on May 1, there were 593 houses under construction in greater Morgantown, a building record difficult to equal in any other city in the United States with a population anywhere near that of Morgantown—12,000, according to the recent census.

So necessary is the matter of additional funds to take care of the building situation that the Chamber of Commerce has also invited several outside building and loan associations in other cities in West Virginia, where there is comparatively little building, to come into Morgantown and place some of their ready cash at the disposal of Morgantown residents either through one of the Morgantown building and loan associations or by means of branch offices of their own organizations.

A. C. STEWART,
Secretary, Morgantown Chamber of Commerce.

Better Sidewalks Committee Gets Quick Action

LIMA, OHIO.—"Better Sidewalks" activity generally consists of propaganda, but in the past two months the Better Sidewalks Committee of the Lima Chamber of Commerce has developed a complete sales campaign out of its job. A report was filed with the Directors the middle of May showing that over two miles of new walks have been laid. Contractors tell the committee that approximately ten miles of walks are under contract to be put down this summer.

As the business policy of the committee has developed, building material companies have placed members of their selling staffs at the disposal of the committee for reasonable service each week.

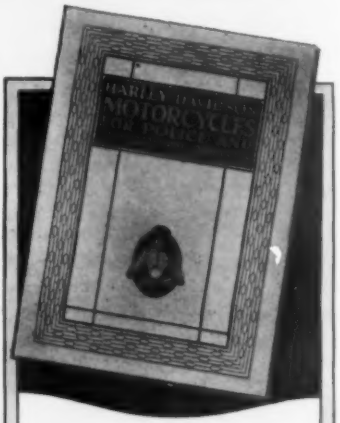
Starting with a long list, dating back over a year, of property owners that the city had notified to build walks, the committee demonstrated that immediate action would save the owner from 5 to 7 cents a square yard in construction costs, as the city had set a figure of 35 cents for doing the work, and sidewalk contractors gave the committee prices ranging from 27 to 30 cents. Personal calls were made on the

Kansas City Police Get 23 More Harley-Davidsons

The first 17 Harley-Davidsons on the Kansas City, Mo., police force proved so successful that 40 are now in use there.

Chief of Police Edwards is enthusiastic about the efficiency and economy of "riding down crime with motorcycles." In one district, 19 policemen with motorcycles are doing the work which formerly required 30 patrolmen.

Kansas City's Harley-Davidsons are used on regular beats, for chasing speeders, in regulating traffic, enforcing parking rules, for hurry-up calls in the detective department, and for chasing "motorized crooks."



City officials and those interested in police department efficiency should have our new book, Motorcycles for Police and Sundry Purposes." Write on your letterhead for your complimentary copy, and see how other cities are using motorcycles to increase police efficiency.

Hundreds of American cities endorse the Harley-Davidson for police and other municipal service. Ask your local dealer for demonstration, or write to us for special literature on police use of motorcycles.

HARLEY-DAVIDSON MOTOR COMPANY
MILWAUKEE WISCONSIN

Harley-Davidson
World's Champion Motorcycle

property owners, and when the least inclination was shown to rebuild the walks, contractors were immediately sent after the jobs.

Pledge cards to show the condition the owner believed his walk to be in, and an "I will put it in good condition," were placed before the members of the Rotary, Kiwanis and Lions luncheon clubs, with speakers to sell the campaign. Over three hundred members of the three clubs stood on their feet and endorsed the drive. A sample of the results was shown when four Rotarians called the chairman of the committee, within twenty-four hours after his talk before them, to find out where they could get a contractor *at once*.

Dividing the committee into four squads and assisted by salesmen of the building supply concerns selling the idea and not their goods or their firm, the campaign has now centered down to a house-to-house visitation in the four sections off the city square, the drive concentrating on the central properties in the city first, but eventually to reach the outlying districts. The first effort of the committee was to get everyone of the 1,349 members of the Chamber to repair his sidewalk before the broader campaign opened.

J. KENNARD JOHNSON,
Manager, Lima Chamber of Commerce.

Volunteers Report Traffic Violations

SPOKANE, WASH.—Renewed effort is being made in Spokane by the Chamber of Commerce to reduce to a minimum the amount of careless and reckless driving of automobiles through the city, by the organization of a so-called Citizens' Vigilance Traffic Committee. There are now over 400 people on the committee, who have pledged themselves to report to the Police Department all violations of the traffic ordinances that come to their attention.

The members are furnished with cards upon which to fill in the place, nature and time of the occurrence, and the license number of the automobile. A number is given to each member which is known only to the secretary of the committee and to the Police Department. This enables him to make his entry quickly while at the wheel of his own machine. When an accident occurs or the case is brought to trial, the name of the complaining committeeman is disclosed, as he is often called upon to testify. The card contains a list of the more common traffic violations for the guidance of the vigilants.

Members No..... Date..... Time... A. M / P. M
Exact Location.....Ave. and.....Street
License No..... Year.....
(Place X opposite proper heading)
1—Fail to give Right of Way at street intersection.
2—Approached pedestrian or vehicle crossing ahead without slowing up.
3—Pass another vehicle or street car at intersection.
4—Passing standing car while loading or unloading passengers.
5—Emerged from alley (without warning) (faster than five miles an hour).
6—Passed vehicle to right.
7—Projecting load not protected by light or flag.
8—Cut corner.
9—Drive on wrong side of street.
10—Turn in middle of block.
11—Failed to signal change in direction, change of speed or stop.
12—Parking on Illinois Avenue.
13—Obstruct traffic.
14—Muffler open.
15—Car running without lights—front, rear.
16—Reckless driving. (Give details.)
17—Vehicle does not display license plate as required by law.
18—Vehicle did not stop after accident and render assistance.
19—Party under legal age operating motor vehicle.
Write in details or other violations.

Owner's / Driver's } Name .....

Address .....

.....

This movement was launched by the Fire and Accident Prevention Committee of the Chamber of Commerce, and has proved a great success. The Police Department is coöperating with the Citizens' Vigilance Traffic Committee by issuing a warning to all first offenders, and by dealing more drastically with repeated offenders. The value of the plan consists chiefly in educating the public and the automobile drivers to the dangers of disregarding the traffic laws, which are formulated for the obvious purpose of preventing accidents.

ALAN G. PAINE,
Office Manager, Spokane Chamber of Commerce.

FOX ROTARY SNOW BROOM

"ENDORSED BY EXPERTS"

GARWOOD FERGUSON
COUNTY ENGINEER OF PASSAIC COUNTY
PATERSON, N. J.

TELEPHONE NO. 8503 LAMBERT

Mr. T. J. Wasser,
State Highway Engineer,
Broad St. Bank Bldg.,
Trenton, N. J.

Dear Mr. Wasser:

As per your recent conversation with Mr. W. G. Fox, of Newark, in regard to testing out his Rotary Broom Snow Remover, I beg to advise that I witnessed the demonstration of this machine yesterday in the Cities of Passaic and Clifton and believe it to be the best type of apparatus for cleaning snow for highway work that I have ever seen. The idea of removing snow by menas of a rotary broom is not a new one, the Street Railway Companies throughout the United States having adopted this method for several years past, but to my mind the success of this particular piece of apparatus lies in the fact of its wonderful tractive power.

The Rotary Broom is mounted in front of an F. W. D. Truck which has sufficient traction on each of its four wheels to drive it through almost any size drift. The Broom is driven independently by means of a powerful auxiliary engine mounted on the rear end of the truck giving the broom a speed of 350 revolutions a minute. It is claimed that the brooms will give at least forty-eight hours' continuous service. The particular one we saw had been in use in Kearny and Newark for the last couple of days and had only lost about two inches of the broom.

I believe that in cleaning snows of from eight to twelve inches in depth there should be no difficulty in cleaning from fifty to seventy-five miles a day.

The fact that the Public Service Company has adopted this type of snow remover with such good results should be sufficient evidence to demonstrate its worth on the removal of snow from public highways.

Yours truly
(Signed) GARWOOD FERGUSON
County Engineer

WRITE FOR DETAILED PARTICULARS

FOX ROTARY SNOW BROOM, 9-11-13 LOMBARDY STREET, NEWARK, N. J.

"Brighten the Corner Where You Are"

The Clean-Up Program Should Run Through the Whole Year

By Allen W. Clark

Chairman, National "Clean Up and Paint Up" Campaign Bureau, St. Louis, Mo.

THE campaign conducted by the National Clean Up and Paint Up Campaign Bureau, established since May, 1912, touches the constituency of THE AMERICAN CITY more closely than any other classes, for everywhere the leaders in its thousands of local campaigns are the officers, especially the secretaries, of the chambers of commerce, the mayors or the city managers, and the street, health, fire and police departments.

But most, or first of all, does the campaign interest the secretary of the chamber of commerce, because of its appeal to all the many classes and interests which he and his organization represent in their association together for effective community service and leadership. A chamber of commerce that once has led all these various elements of the people to unite in achieving such constructive and permanent results in the public welfare is on solid ground for all its other undertakings. That fact perhaps explains why the chamber that once establishes a Clean Up and Paint Up Campaign in its annual program seldom abandons it, but regularly renews the campaign every spring—and some of them every spring and fall—thus confirming and adopting for its own the Denver verdict, stated in the annual report of that chamber, after its third annual campaign in 1914: "Clean Up and Paint Up has become a permanent field of profitable effort for the Denver Chamber of Commerce." This decision has been approved by every succeeding administration, and the 1921 campaign in Denver was in charge of the Chamber's Real Estate Bureau.

Indeed, in most of these campaigns the chamber of commerce secretary is the impelling and guiding force that enlists the interest of the various essential factors, brings them together, and counsels the organization, program and direction of the work, even though he and the chamber frequently keep in the background while an affiliated organization "conducts" the campaign.

Itself a straightforward and self-respecting alliance of enlightened self-interest and public service, the campaign makes that self-same appeal to every class. Its proposal to each class, or official, to each man or woman whose coöperation is sought, is to help him or her in the special job in which he or she is most interested. The thousands of friends and supporters it has secured and held by this appeal through all the years of its activities would make a quite representative if not complete roster of the men and women nationally prominent in all the practical efforts for community improvement, in sanitation and beautification, and in the conservation of life and health, and of property, against the ravages of disease, fire and deterioration.

This campaign appeals to the mayor because it is he who feels the most pride—or shame—in the appearance of his city when he presents "the key of the city" to visiting conventions. He knows, too, that he and his administration are expected to reflect the character, the soul of the city, and that since the women have become citizens in reality and power, the city's soul has been enlarged and awakened, and that, first of all in this new order of things, slatternliness in municipal house-keeping will be tolerated no longer.

Moreover, the mayor who has been on the job long enough to be familiar with it has perhaps grown tired and ashamed of the boasted tonnage or cubic yards of dirt and rubbish hauled during an ordinary "Clean Up Week"—as any housewife would be ashamed to make a similar confession of her own house cleaning!—and such mayors and their lieutenants in the street, health, fire and police departments see in the Clean Up and Paint Up campaign the means and the methods whereby the necessary house cleaning in spring and fall shall be made a less arduous task, through the simple expedient of keeping clean, day by day.

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NEWPORT 542 West 10th Street **KENTUCKY**

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

City Ordinance Forbidding Members of Fire Department to Become Members of Unapproved Labor Union, Upheld

The city of Dallas adopted an ordinance forbidding members of its fire department to become members of an association not approved by the chief of the fire department and the fire commissioner, and requiring withdrawal from membership in any organization deemed by such officials to be "detrimental to the duties and service required to be performed by the members of the fire department," etc.

Certain firemen of the city refused to withdraw from a local union affiliated with the American Federation of Labor, asserting their right to organize for mutual protection in their work. They were thereupon discharged, after a hearing on charges of violation of the ordinance above mentioned, and sued to require their reinstatement.

The decision announced by the Texas Court of Civil Appeals in the case of McNatt vs. Lawther, 223 Southwestern Reporter, 503, sustains the action of the municipal authorities. The Court says:

"The Board of Commissioners of the city of Dallas had the interest of the public, as well as the employes of the city, to consider. . . . The commissioners may have taken into consideration the effect of the increased probability of strikes by the policemen or firemen of the city, as a body, if such employes were permitted to become members of an organization which might bind them to act as a body in such matters. The dire consequences of such a strike have been exemplified in the comparatively recent strike of the policemen of the city of Boston. The adoption of the ordinance referred to, or similar rules and regulations, may have been the result of a purpose to minimize, as far as possible, the probability of some calamity in the city of Dallas. We are not called upon to express an opinion as to whether such rules were wise or not. We do conclude, however, that we cannot say that the adoption and enforcement thereof by the constituted authorities of the city was arbitrary or capricious."

Plaintiffs relied on a provision of the Dallas charter and a section of the Texas statutes as entitling them to retain their positions. The charter provision is to the effect that all policemen and firemen shall hold their positions during good behavior and shall only be removed for causes rendering them unfit, in the opinion of the city commissioners, to remain in the service, and after hearing of charges against them. The statute guarantees the right of "all persons engaged in any kind of work or labor" to form trade unions.

As to the charter provision, the Court holds that because there might be divergent views as to the propriety of refusing city employes permission to organize themselves, the courts could not interfere.

As to the statute, the opinion says:

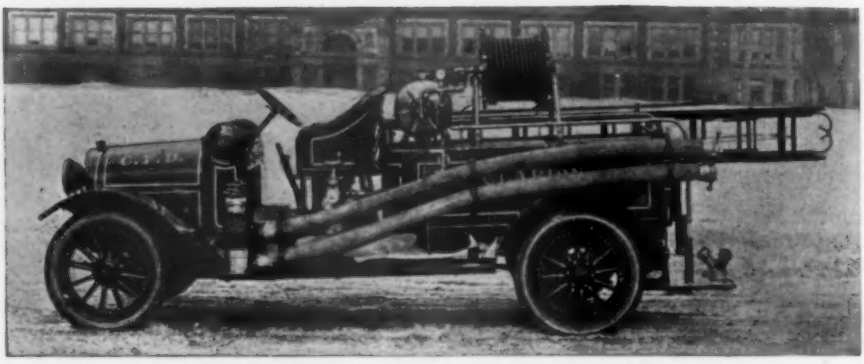
"It was probably the purpose of this legislation to make it clear that the early English decisions, which held labor unions under certain circumstances to be unlawful, and our own laws against trusts and combinations in restraint of trade, did not apply to labor unions. But, on the other hand, it did not seek to regulate the attitude of the employer toward the organization of unions among his employes, and we take it that, if the employer should see fit to prohibit his employes from becoming members of such 'trade unions' on pain of discharge in case of violation of such prohibition, such act would not be in violation of this law. . . .

"If the act had sought to impose any restrictions upon the freedom of the employer in such matter, it would probably be held unconstitutional."

In the somewhat similar case of San Antonio Fire Fighters' Local Union vs. Bell, 223 Southwestern Reporter, 506, another branch of the same court upheld the right of the governing authorities of San Antonio to discourage formation of unions among the city's firemen. In that case it was said:

"The general rule is that, in the absence of a contract, the employer has the authority to discharge an employe with or without reason, and the only change made in that rule, so far

Northern Fire Apparatus



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as the city of San Antonio is concerned, is that charges must be preferred in writing, and the trial must be public on these charges. It must be inferred that the Legislature intended that the charges must not be frivolous or trivial, for such charges would be fraudulent. It must be presumed that, before any of appellant's members are removed or discharged, proper charges in writing will be filed and a just trial had thereunder. . . .

"It cannot be said, as a matter of law, that a municipal corporation has no right or authority, as must be the claim of appellant, if there is any basis for this suit, to determine that membership in a certain organization renders its appointees inefficient or untrustworthy, and, even without admission on the part of one of the affiants that he owed a higher duty to his union than his city in case of orders for a strike upon the part of the firemen, it cannot be assumed that a fair trial will not be given the members of the union. To make such assumption and grant an injunction to prevent the commissioners of the city from performing their functions under the charter, granted by the Legislature of Texas, and transfer the trial of officers or employes to the district court, would be a usurpation of power which cannot be consistently sanctioned in a democratic government. . . .

"The right of a municipal corporation is the same in regard to its employes as is that of an individual or private corporation, and in the case of the charter of San Antonio there is no attempt to destroy that right, but merely to prescribe the method in which it must be exercised. The charter has merely said that the right to employ and discharge or remove remains, but the removal cannot be made in two years unless charges are preferred in writing and a public hearing given thereon.

"The exercise of the power of the removal of an officer or employe is essentially administrative or executive. The San Antonio commissioners do not constitute a court, but are an administrative body, and the power to remove officers is administrative power, to be used for the purpose of maintaining discipline and good order in the management of the business of the city."

Railroad May Be Required to Keep in Repair Roadway of Bridge Over Its Tracks

The Minnesota Supreme Court recognizes the right of a city to require a railroad company to bear the expense of repaving the surface of a bridge constructed by the company over its tracks. (City of St. Paul vs. Great Northern Railway Company, 177 Northwestern Reporter, 492.)

Many years ago the defendant railway company bridged its tracks at their intersection with Rice Street in St. Paul. The bridge was paved. The paving on both the street and the bridge became so out of repair that in 1917 it was necessary to repave. That the safety and convenience of the public required repaving was conceded. The defendant refused to repave, claiming that its duty was discharged when it built the bridge and maintained a sufficient structure to sustain a surface for travel. The city repaved the bridge when it repaved Rice Street, and sued the railroad company for $1,938.30, the cost, for which it had judgment.

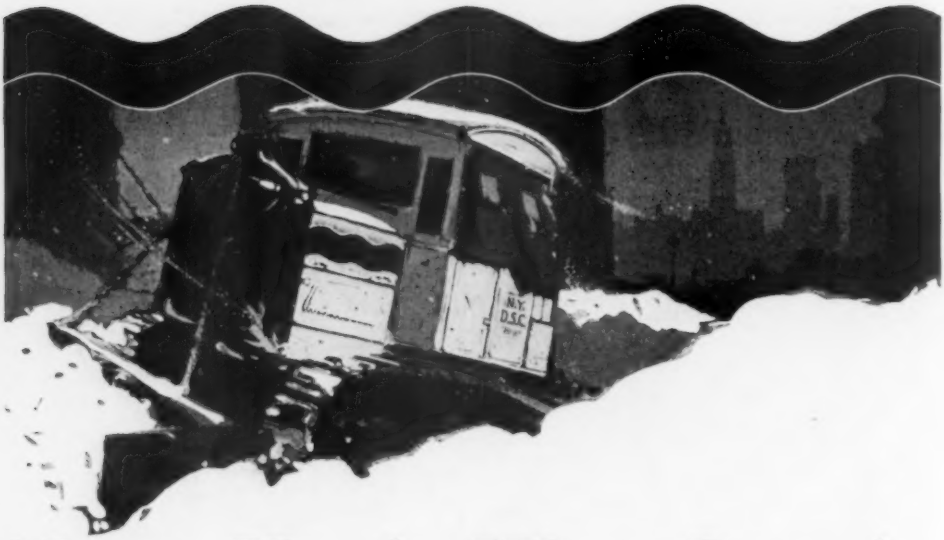
Affirming this judgment, the Court says, in part:

"The sole question is whether a railroad company, which in the exercise of the police power is compelled without compensation to bridge its tracks, is required, when the pavement of the bridge becomes so worn that it must be replaced, to replace it without compensation.

"The question has not been directly set at rest by a decision of this court. The court seems often to have assumed the law to be that the uncompensated duty rests upon the railroad to keep its bridge, made necessary by its disturbance of the safe use of the street for travel, continuously in fit condition for public use, and often the railroads seem to have acquiesced; and expressions to the effect that it is the duty of the railroad company to maintain the highway in a fit condition for travel, that a bridge is a safety device which in a proper case must be constructed and maintained by the railroad, that the railroad must restore the highway which it disturbs to its former condition of usefulness, and that its duty is a continuing one, are frequent in the cases. . . .

"The duty of the railroad comes from an exercise of the police power. It is not at an end when it constructs a bridge sufficient at the time to bear public travel. It must rebuild worn-out structures. . . . It must respond to an increased public need. City of St. Paul v. Great N. R. Co., 138 Minn. 25, 163 N. W. 788, L. R. A. 1917F, 485. There we held that the railroad might be compelled to strengthen its bridge so as to carry street railway traffic though such traffic was not on the street when the bridge was built. . . .

"The railroad's interference with safe public travel is continuous, and the obligation of the railroad to conserve the safety and convenience of the public, imposed under the police power, is as continuous as its interference with safe public travel. The required structure must be sufficient to sustain public travel, and the railroad must furnish a fit surface upon which public travel may pass. Its obligation to repave is as definite as its duty to bridge. It is not enough that it furnish a structure physically sufficient to support a roadway. It must furnish the roadway. When worn out it must replace it."



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A blizzard rode into New York on a fifty-mile gale one night last February, and buried the city under more than a foot of snow. Had New York been unprepared traffic would have been paralyzed and the lives of thousands threatened by fire. *But New York was ready.* Against just such emergency, city officials had authorized the purchase of fifty Holt "Caterpillar"* Tractors. Early next morning the "Caterpillars"*, pushing 10-ft. snow plows, battered through the drifts which choked lower Broadway, Fifth Avenue, and the approaches to bridges and ferries. Later they cleared the residential districts. The cost of the "Caterpillars"* was returned many times over by the business losses they prevented. What the "Caterpillar"* did for New York it will do for any other city. Let us arrange to show our motion pictures of the "Caterpillars"* bucking New York's snow. Write or wire for further information.

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COLLECTION AND DISPOSAL OF MUNICIPAL REFUSE

Rudolph Hering, Consulting Engineer, New York City, and Samuel A. Greeley, Consulting Engineer, Chicago, Ill. McGraw-Hill Book Company, Inc., New York City. 1921. XII + 653 pages. Illustrated. $7.00 postpaid.

When one considers that before the publication of this book there was practically no up-to-date, reliable and authoritative publication on this most important subject of municipal concern, some idea of the welcome it will receive from sanitary engineers and municipal officials may be appreciated. The authors have placed at the disposal of the reader the work and study of their professional careers and have brought into the printed page much material which has never before been as readily available. The subject is treated in a thorough and logical manner, beginning with a classification and definition of the various refuse materials for treatment at the house, hotel or other point of origin, carefully considering the details of collection methods and equipment, transportation with cost, and the methods of disposal. The closing chapters, after the discussion of garbage, deal with street refuse, night-soil and dead animals, and a careful delineation of the problem as applied to small towns and villages. No municipal, technical or civic library, engineer or municipal official dealing with this important subject can afford to be without this volume, covering completely a subject which began to receive careful, scientific study only two decades ago.

HIGHWAY ENGINEERING—RURAL ROADS AND PAVEMENTS

George R. Chatburn, Professor of Applied Mechanics and Lecturer on Highway Engineering, University of Nebraska. John Wiley & Sons, Inc., New York City. 1921. XII + 379 pp. Illustrations, diagrams and tables. $3.00.

A new book, covering the most recent and the best practice in the construction of rural roads. Special attention is given to detail construction of those types of roads mos common in the rural and country districts, small cities and towns. The book is particularly adapted for study by the layman or official who is not a trained engineer.

THE STORY OF ENGLISH PUBLIC HEALTH

Sir Malcolm Morris, K.C.V.O., Fellow of the Royal Sanitary Institute. Funk & Wagnalls Company, New York City. 1921. XI + 166 pp. $1.50.

An interesting historical sketch of the evolution of the public health system of England and Wales. The preparation of this book by Sir Malcolm Morris was caused by the increased interest in the subject of public health following the creation of the Ministry of Health in England. The book is entirely historical in character and should prove of interest and inspiration to public officials, particularly those intimately connected with health matters

The publications listed above are for sale by their publishers or through the Book Department of THE AMERICAN CITY. *Those listed below are understood to be free upon application.*

RECREATION

"Playgrounds and More Playgrounds—How to Get Them," by Harrison Gray Otis. 8 pp. Illustrated. An account of practical methods employed to increase interest in playground developments, published as No. 197 of The American City Pamphlets, by The Civic Press, Tribune Building, New York, N. Y. (Apply to publishers.)

MUNICIPAL WASTES

"Municipal Wastes, Their Character, Collection and Disposal," by H. R. Crohurst, Associate Sanitary Engineer, U. S. Public Health Service. Published as Public Health Bulletin No. 107. 98 pp. Illustrated. 1920. Thorough consideration of the subjects, with special emphasis on disposal, including methods and costs. (Apply to U. S. Public Health Service, Washington, D. C.)

BRICK PAVING

"Economy in Construction and Maintenance of Brick Streets and Highways," by Will P. Blair, Vice-President of the National Paving Brick Manufacturers Association. 15 pp. Illustrated. 1921. "The Significance of Local Conditions in the Design of Brick Pavements," by Maurice B. Greenough, Secretary of the National Paving Brick Manufacturers' Association. 14 pp. Illustrated. 1921. Papers presented before the Indiana Engineering Society. (Apply to Maurice B. Greenough, Secretary, National Paving Brick Manufacturers' Association, Engineers' Building, Cleveland, Ohio.)

SCHOOL LUNCHROOMS AND DOMESTIC SCIENCE

Two pamphlets, published by Albert Pick & Company, 208-224 West Randolph Street, Chicago, Ill.: "Feeding the School Child," a discussion of school cafeterias and lunchrooms, with special emphasis on the home economics lunchroom in city and community schools; and "Practical Domestic Science in City and Country Schools," with many valuable suggestions on the teaching of this subject. (Apply to publishers.)

POLICEWOMEN

"Tentative Digest of the Work of Policewomen in the United States and Foreign Cities," compiled by the International Association of Policewomen. 51 pp. 1921. This pamphlet contains the answers to a questionnaire on such subjects as numbers employed, uniforms, salaries, powers, etc. (Apply to G. S. Davis, Women's Division, Police Department, 12 and Grand River Avenue, Detroit, Mich.)

Baltimore, Md.—Twenty-sixth Annual Report of the Free Public Bath Commission for the fiscal year ended December 31, 1920. (Apply to Robert F. G. Kelley, Secretary and Superintendent, Baltimore, Md.)

Brantford, Ont.—Financial Statement of the Municipal Corporation for the year ending December 31, 1920. (Apply to H. F. Leonard, City Clerk.)

Dallas, Tex.—Progress Report, March, 1921, including Da summary of Dallas Public Health Activities for 1919 and 1920, by Leslie C. Frank, U.S.P.H.S., Director of Public Health, Dallas. Report of the United States Public Health Service Cooperating with the Dallas Public Health Administration. (Apply to author.)

Dunkirk, N. Y.—The proposed Hydro-Electric and Water Supply Development from Canadaway Creek for the City of Dunkirk, N. Y. Presented by the Board of Water Commissioners. (Apply to James P. Morrissey, Board of Water Comimssioners, Dunkirk, N. Y.)

Easton, Pa.—Thirty-fourth Annual Report, including the Mayor's Message, Controller's Report, and Department Reports, for the fiscal year 1920. (Apply to Hon. S. S. Horn, Mayor.)

Greenwood, S. C.—Annual Reports of the Greenwood Town Council and the Greenwood Water and Electric Light Plant, for the year 1920. (Apply to R. J. Cartledge, Jr., Clerk and Treasurer.)

Jackson, Miss.—Quarterly Financial Statements for the periods from October 1, 1920, to December 31, 1920, and from January 1, 1921, to March 31, 1921. (Apply to A. W. Tobias, City Auditor.)

Ogden City, Utah.—Annual Report of the Auditor for year 1920. (Apply to A. F. Larson, City Auditor, Ogden City, Utah.)

Rockford, Ill.—Eleventh Annual Report of the Board of Commissioners of the Rockford Park District, covering the period January 1, 1920, to December 31, 1920. (Apply to Levin Faust, President, Rockford Park District Comimssion, Rockford, Ill.)

Springfield, Mass.—Forty-seventh Annual Report of the Board of Water Commissioners, together with the reports of the Water Registrar, Superintendent and Chief Engineer. For the year 1920. (Apply to Alfred R. Hathaway, Water Registrar and Clerk of Board, Springfield, Mass.)

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Trackless Trolley Demonstrates Practical Economies

OVER one hundred well-known street railway officials and engineers witnessed a successful demonstration of the trackless trolley bus at Schenectady, N. Y., on June 15. A half-mile of double wire overhead was erected for the tests, and the visitors spent the day examining the car and riding over the route.

The trackless trolley bus resembles in general appearance the present safety car and seats 30 passengers. Its speed is about 20 miles per hour. The electrical equipment consists of one G.E. railway motor and a K type controller arranged for foot operation and dead-man's control. Protective apparatus includes a circuit breaker on the positive side and a fuse on the negative.

Two overhead wires on 14-inch centers supply the current, at 600 volts, taken into the car by a sliding type collector, maneuvered by the motorman from his seat by means of a lever which disengages the collector from the overhead and allows a leeway of 18 feet—9 feet on each side—for passing other vehicles. This arrangement allows two cars to operate in opposite directions on the same wire. The bus demonstrated at Schenectady was built by the Atlas Truck Corporation, York, Pa.

The following statement and figures were prepared by the engineers of the General Electric Company:

"Where new routes or extensions to existing routes are required, it is desirable that careful consideration be given to railless transportation to be provided either by trolley busses or gasoline busses.

"The relative operating costs per mile of the trolley bus and the gasoline bus are approximately as follows:

	Cents Per Bus Mile, Trolley Bus	Gasoline Bus
Maintenance of way and structure	0.5	0.5
Maintenance of equipment	4.0	9.5
Power	2.1	4.99
Platform	7.05	7.05
General expense	2.4	2.4
Depreciation	1.9	3.43
Total	17.95	27.87

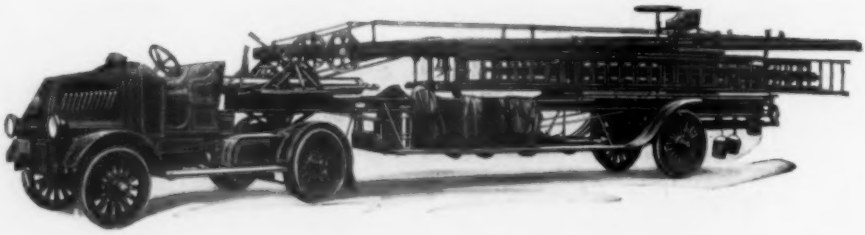
"The maintenance of equipment, general expense and depreciation of the trolley bus are based on known costs of the standard safety car, while the platform and power costs are calculated on the basis of 60 cents per man hour, 8.5 m. p. h. schedule and 1.5 cents per kw. hr. for power. The costs for the gasoline bus are the average of seven companies operating this type of vehicle in city service.

"The saving in operating cost is about 10 cents per bus mile in favor of the trolley bus. Assuming 33,000 miles per year per bus, this is equivalent to an annual saving in operating cost of $3,300 per bus in service.

THE TRACKLESS TROLLEY TURNS FREELY TO AVOID TRAFFIC

"The first cost of a trolley bus installation is higher, due to the overhead construction required for the operation. This will cost about $4,500 per mile of single set of wires, and $5,500 per mile of double set of wires, based on wooden poles and cross-span construction. Fixed charges covering interest, depreciation and taxes on the investment on overhead line will not exceed 15 per cent; however, the total costs of operation, including these fixed charges, will be materially lower than that of the gasoline bus.

"A 5-mile route can be operated with trolley busses on a 15-mile headway at a total cost, including fixed charges, of $40,000 per year. To give the same service with gasoline busses would cost $52,000 per year. With 10-minute service, the saving by use of trolley busses would be $17,500, and on shorter headways still greater."



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PERFORMANCE COUNTS

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Road-Building Tractor

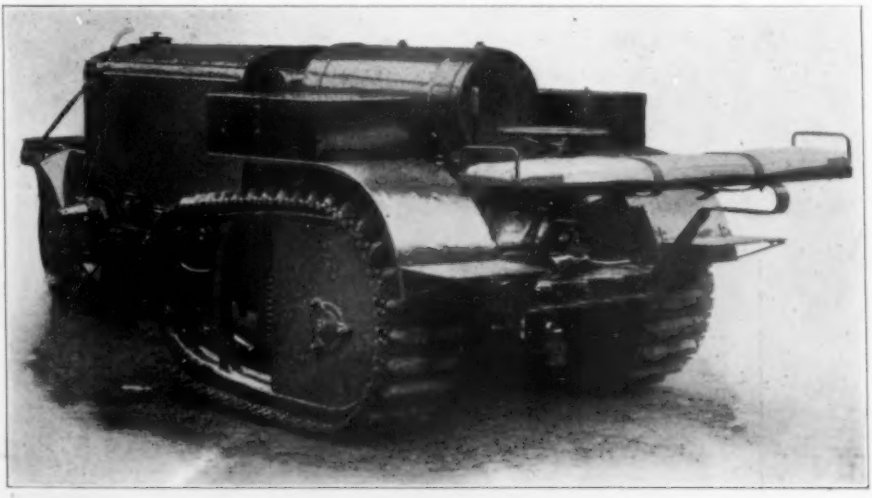
To take care of the demands of the road-building industry for a heavy service tractor, the Yuba Manufacturing Company, 433 California Street, San Francisco, Calif., has developed a machine especially built for road building and maintenance. This Yuba road builder is a 25-40 machine, the grouser plates of which are of cast steel with a flat area in contact with the road, about 16 square inches for each tread. These treads are particularly resistant to wear and are so designed that they cannot mar the finest pavement. The entire width of the front wheel rests squarely on the road. The seat for the operator is of the artillery type, 14 inches wide and 6 feet long, mounted on two sets of leaf springs and fitted with a stuffed cushion. This provides for two persons besides the driver, or enables the driver to shift from side to side to watch the road or stakes ahead.

The treads are covered with wide, heavy fenders to protect the driver from dust and dirt, affording protection from accidental contact with moving treads, and support for the tool boxes. The Yuba tractor is particularly well known in the West, having first proved its worth in the agricultural field and then in the road-building field. In a test of a Yuba tractor pulling a grader between Dallas and Fort Worth, Texas, the dynamometer showed a starting pull of 6,100 pounds and between 5,000 and 5,500 pounds under steady operation. The outfit turns readily as sharply as the grader and can swing in its own length.

Maximum Demand Controllers for Pipe Lines

Some water-supply systems are required to furnish an adequate minimum pressure for fire protection, and if they also have one or more large consumers whose demands are so great as to nearly equal the pipe line capacity, the pressure available for other purposes may be reduced seriously. Such a condition may occur on a gravity line with a large consumer at the far end from the source and with one or more intermediate communities having only a slight draft on the line. The pipe line can furnish the amount needed by the large consumer without affecting the pressure of intermediate communities if the large quantity of water be delivered at a reasonable rate. For this purpose a maximum demand rate of flow controller has been developed by the Simplex Valve and Meter Company, 5722 Race Street, Philadelphia, Pa. This controller prevents the drop in pressure due to excess peak demands on the water-supply line.

The hydraulic gradient without the rate con-



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You cannot get a truck that is better suited to your business than a Federal

There is a capacity built to fit your needs—a body made to meet your requirements

Federal engineers know the needs of business—and build Federal trucks to efficiently and economically fit them

Another **FEDERAL**

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MUNICIPAL officials are conservative purchasers. They buy only the best—tested and proved through the years. Their preference for Federal is due to its known value—its sterling record of performance during the 11 years of its manufacture. This is one of nine Federals in the various city departments of Jersey City, N. J.

FEDERAL MOTOR TRUCK CO.
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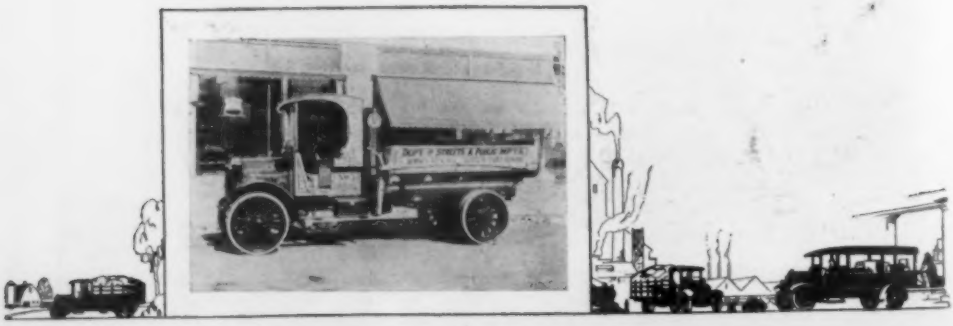
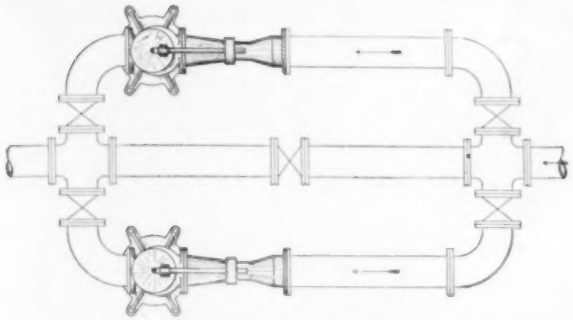




SIMPLEX METERS SET IN PARALLEL

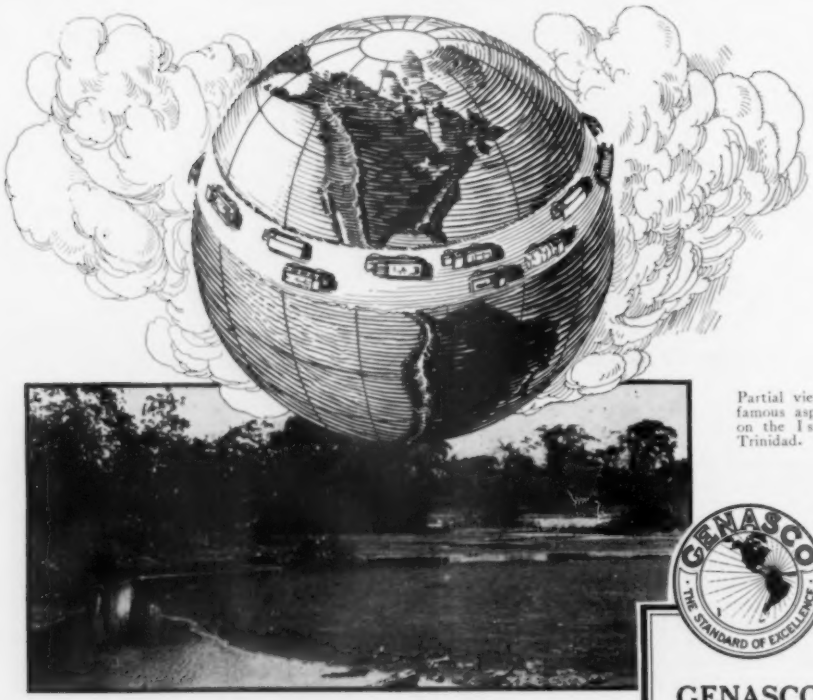
troller is far below the lowest hydraulic gradient when the controller is installed. The maximum demand controller remains open at the predetermined setting until the rate of flow reaches the prescribed maximum. From this point on, the opening of the controller is just sufficient to permit the specified rate of flow, and no more, to take place. A typical arrangement for installing a controller is shown in the accompanying illustration. The controller can be by-passed in case of emergency and the line permitted to deliver its full capacity. The apparatus may also be installed in parallel, each one covering half the full amount of flow. Either of the two controllers, however, may be used separately to supply the demand.

The principle of operation of the maximum demand controller is briefly as follows: It consists of a Venturi tube with the discharge flange connected to a valve body provided with a double-disc type balance valve. The valve stem, guided in the upper and lower covers, engages a diaphragm near the bottom of the valve body and at the top is attached through a flexible connection to the short arm of a lever or scale beam. For any given rate of flow there exists a certain difference between the water pressure in the valve body and that in the throat of the Venturi tube, due to the difference between velocities at these points. The downward pressure on top of the diaphragm is greater than the upward pressure below, and for this reason there is transmitted to the short arm of the scale beam a downward pull that is balanced by the counterweight on the longer arm of the scale beam. This balance of the counter-weight and the diaphragm loads limits the maximum rate of discharge through the controller. This fact is obvious, since, if the rate of flow should momentarily increase beyond the allowable maximum, the diaphragm load would also increase, thus diminishing the valve opening until the balance is automatically restored. Altering the position of the counter-weight on the longer beam arm changes the maximum permissible rate of flow.

Drinking Fountains for Municipal Buildings

A distinctive type of sanitary drinking fountain, known as the Tyrone, is manufactured by the Crane Company, 836 South Michigan Avenue, Chicago, Ill. This angle-stream drinking fountain, mounted on a heavy vitreous pedestal, has a 14-inch diameter bowl with an angle bubbler protected by a cowl, both of which are integral parts of the pedestal. The supply and waste connections are of cast brass with an iron supply pipe to the floor. All of the exposed metal parts, including the operating valves, are of nickel-plated brass. The height of the fountain to the top of the pedestal is 30 or 36 inches, the bowl is 4½ inches deep, and the pedestal itself is 14 inches wide across the octagonal base.

A CLEANLY AND ATTRACTIVE DRINKING FOUNTAIN WITH HEAVY VITREOUS PEDESTAL AND 14-INCH-DIAMETER BOWL CONTAINING ANGLE BUBBLER



Partial view of the famous asphalt lake on the Island of Trinidad.

All good streets lead from Trinidad

Wherever the art of modern street building is practiced, the finest streets and highways are surfaced with Trinidad Lake Asphalt—the standard paving material of the world.

Trinidad Lake Asphalt combines beauty and permanency to a higher degree than any other bituminous paving material known. It is resilient, noiseless, easily repaired and holds the record for low maintenance.

Trinidad Lake Asphalt is a native bitumen—a product created by nature and storm-beaten and sun-cured in the tropics for ages. Neither torrid heat nor arctic cold affect its binding and wear-resisting properties.

More than four million tons of this remarkable material have been used in street and road building since 1879—enough to surface a roadway, eighteen feet wide, extending around the entire world.

Trinidad Lake Asphalt is the foundation for numerous asphaltic protective products now included in the famous Genasco Line. Detailed information regarding any of these will be sent on request.

Before paving new streets or repaving old ones, write for "The Asphalt Time-Table."

THE BARBER ASPHALT PAVING COMPANY

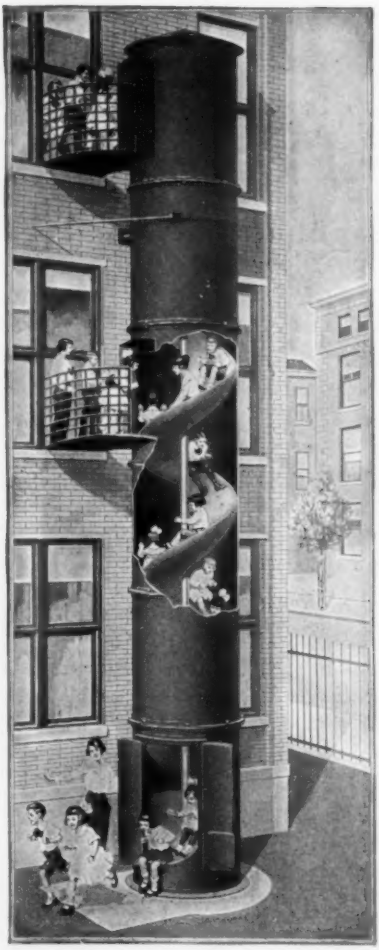
New York PHILADELPHIA Chicago
Pittsburgh St. Louis Kansas City Atlanta

GENASCO
THE STANDARD OF EXCELLENCE

GENASCO LINE

- Trinidad Lake Asphalt (For streets and roofs)
- Standard Trinidad Built-Up Roofing
- Bermudez Road Asphalt (For road building)
- Genasco Roll Roofing
- Genasco Sealbac Shingles
- Genasco Latite Shingles
- Genasco Vulcanite Mastic (Flooring
- Genasco Acid-Proof Paint
- Genasco Industrial Paint
- Genasco Boiler Paint
- Genasco Asphalt Putty
- Genasco Asphalt Pipe Coating
- Genasco Asphalt Fibre Coating
- Genasco Tile Cement
- Genasco Water-proofing Asphalt
- Genasco Waterproofing Felts and Fabrics
- Genasco Battery Seal Compound
- Genasco Mineral Rubber
- Genasco Mineral Spirits
- Genasco Base Oils
- Genasco Flotation Oils
- Genasco Motor Oils
- Genasco Soluble Oils
- Iroquois Road-building Machinery

TRINIDAD LAKE ASPHALT



A FIRE-ESCAPE THAT IS SAFE AT ALL TIMES

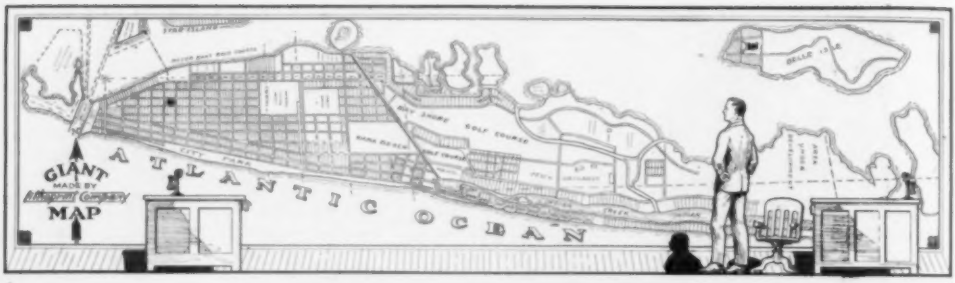
A Safe Fire-Escape for Schools

Many people are well acquainted with the spiral fire-escapes which have been exhibited from time to time at pleasure resorts and fairs. This type of fire-escape, known as the Kirker-Bender Spiral Slide, is manufactured by the Dow Wire and Iron Works, Louisville, Ky., and consists of a smooth, galvanized spiral slide enclosed in a cylinder 5 feet in diameter. It is constructed entirely of steel and is equipped with automatic entrance and exit doors. When used as an outside escape it rests upon its own foundation, not depending upon the building for its support, and is connected to the windows by means of iron runways protected by latticed iron railings. It is ordinarily placed between windows so as not to obstruct light. The entrance doors have projecting frames, and they can be opened inward without interfering with the slide. These doors close automatically to prevent the entrance of smoke and heat. The exit doors open outward at a very light pressure of any object sliding against the inside automatic latch plate opening the doors. The slide comes within 18 inches of the ground, so that the escaping person will naturally walk away from the escape upon reaching the exit. A steel roof covers the escape, protecting it from ice and snow, which are such a menace to life on step escapes. This slide fire-escape may be incorporated within the walls of the building, occupying a comparatively small space.

Eliminating Service Box Trouble

To the superintendent of water-works who is looking for a service box in which he will find no more trash, no more broken or lost bolts or tops, which he will not be obliged to dig up to adjust the grade, and in which there will be no more damaged service cocks or leaky pipes, caused by heavily loaded wagons, and no more cocks that are inoperative by reason of failure to engage the key, the H. W. Clark Company, 130 South 17th Street, Mattoon, Ill., states that the C. M. B. service box which it manufactures eliminates all these troubles. The Clark long screw cap in the top of the box needs only one revolution to open and raise the cap to a height of one inch. It is of cast iron and does not tempt theft as does the brass screw. The flanged top gives good support at the surface of the ground, and the bronze bushing prevents corrosion at that point. The fin at the side of the top prevents the box from turning, and the sliding extension of the body allows raising and lowering of the box through frost action without disturbing the base setting, and insures the proper height at all times. It also prevents surface loads and stresses from being communicated to the service cock or pipe. A beading between the upper and lower sections prevents them from separating. One feature of the heavy cast iron base is the two notches, one for the ¾-inch pipe and one below for the 1-inch pipe which keeps the service cock always in the center. It is impossible for the box to shift lengthwise or sidewise, nor can the cock turn, as it is held securely by the interior box construction so that no rigid connection is required between the box and the service cock.

AN EXTENSION SERVICE BOX



A Map As Long As A City Block

A GIANT MAP OF GIANT VALUE

Of Course, "It's a Lithoprint"

THINK of it, Brother Engineer! A map actually made *30" wide and 1620" long, in one piece.* And we could have made it 60" wide and as much longer as the customer wanted. Another job we handled successfully was a map in only *three* perfectly matched sections 162" wide and 180' long. These are two among many of the giant maps we have made that have solved questions that gave engineers many sleepless nights. The Lithoprint Process is the only way by which you can have maps made at a reasonable price that answer your every requirement for permanency, accuracy and legibility. Made with printers' ink on any material — paper, cloth or tracing cloth — and true to scale. Furnished mounted on rollers if desired.

Write for full information—a post card is sufficient. City Engineers should read our booklet "Assessment Maps: Their Construction and Upkeep." Sent without cost on request

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LITHOPRINT COMPANY OF N. Y., Inc., 41 Warren Street, New York

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We are prepared to inform municipal officials regarding

1. Present cost of raising money
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Our Municipal Department handles state, county and municipal bonds representing over thirty states in the union. Our experience and facilities are at the disposal of any municipality.

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THOMPSON-FLEMING

FORMERLY

BUFFALO MUNICIPAL EQUIPMENT CO.

174-176 Ellicott St. Buffalo, N. Y.

Dry Feed for Water-Works

Many chemicals that are now applied in solution in water-works coagulation can be applied as dry powder if suitable control mechanism is available. Particularly is this true with alum, soda ash, sulphate of iron, and lime, the solutions of which can be eliminated by applying these chemicals in the dry state. Dry-feed applications bring an end to the difficulties from leaking tanks, corroded constant level boxes, clogged orifices, broken valves and the untidiness and disagreeable features common to all solution feed systems. Dry-feed application reduces labor, provides a ready check on chemicals, and in operation actually effects a saving in materials.

A NEW TYPE OF DRY-FEED MACHINE FOR WATER-WORKS CHEMICALS

Wallace & Tiernan, Inc., Newark, N. J., have just placed on the market the Booth dry feeder, which is particularly adapted to the application of heavy water-works chemicals. The feed table, traveling at the slow rate of 1½ to 8½ revolutions per minute, depending upon requirements, is actuated by worm gears running in oil, by a ½-horse-power motor or other source of power. With any given set of gears the rate of revolution of the feed table is uniform. The rate of feed of the dry powder may be decreased or increased by raising or lowering the adjustable collar which surrounds the feed chute.

In order to insure an even flow of the powder from the storage hopper to the feed table, there is provided within the hopper an agitator which maintains a uniform supply of powder above the feeding point.

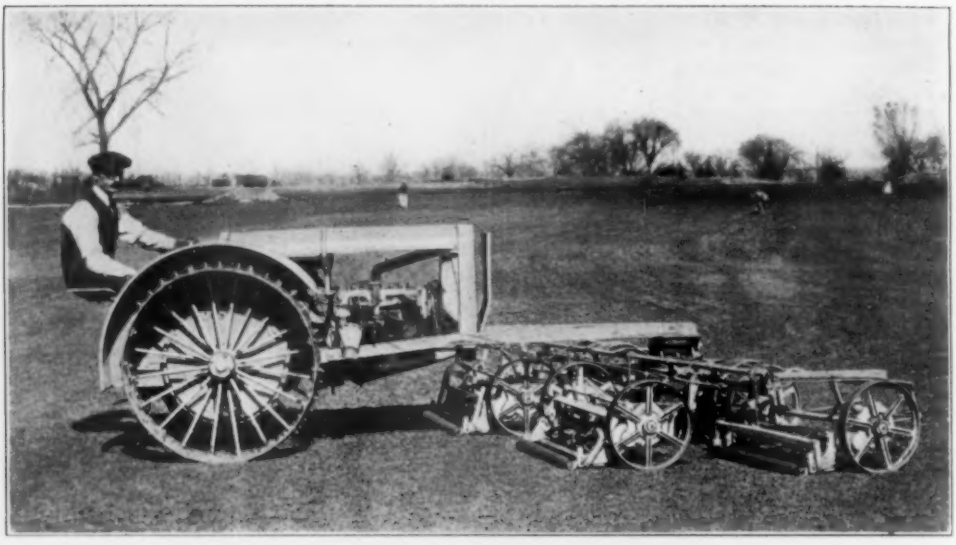
If solution feed is desired, the dry powder scraped from the feed table is discharged into the flushing hopper, from which it is conveyed by a stream of water to the point of use. If the feeder can be installed close to and just above where the dry powder is to be delivered, the flushing hopper shown in the foreground is not required, and a chute from the feed table may be substituted to deliver the powder which has been scraped off the table to the point of application.

Discrimination Needed

Chief Engineer Frank J. Daniel of the Wisconsin Inspection Bureau, Milwaukee, Wis., states there is much reason for worry among insurance companies and their representatives over what he believes to be a decidedly erroneous tendency on the part of small cities when buying motor fire department equipment. Illustrating his point, he said that if one wants a watch, one goes to a jeweler's, but city authorities seem to be going anywhere but to experienced fire apparatus manufacturers for motor equipment.

"There is naturally a wide difference between experience in making automobile trucks and experience in making fire engines," he said. "Agents of companies that make the best promises of reratings if equipment is bought, seem to get the business. There are innumerable requests for reratings, and we frequently find that equipment and changes on which such requests are based were not even tested before being taken on and paid for. But recently a new motor fire pump burned out the bearings on the first test. In another case, a crank-shaft broke. City and town authorities disregard advice. Possibly they feel the advice is prejudiced, but the real student of these problems will not feel that way.

"Fire protection is water on the fire, not equipment or appearance. Tests can be had free of charge at any time. They do not cost the town a penny. There are no doubt good motor pumps built in many factories. The peculiar strains of the fire pump, however, are a problem very different from that of a truck for hauling. The fire pump must not fail, absolutely not. This is in itself a reason for making tests of new equipment before it is accepted and the old equipment discarded."



A New Triumph For

PENNSYLVANIA
Quality
LAWN MOWERS

THE Superintendent of the Denver Country Club hooked up a gang of five Pennsylvania Quality Lawn Mowers to his tractor.

The results showed a cutting capacity of 60 to 80 acres per day—about double that claimed for any similar method.

This arrangement has also been in use on the grounds of an Atlantic City Club, and an outfit has been just shipped to the City of Richmond, Virginia.

This is the most efficient and economical method of cutting grass on large areas especially where the surface is undulating and variable.

Each unit is complete in itself and interchangeable, and made with that skill and conscientious care for which the Pennsylvania Quality line is famous.

All the exclusive features of adjustment; self-sharpening, crucible steel blades, and automobile type ball bearings are embodied in each unit.

PENNSYLVANIA LAWN MOWER WORKS, Inc.
1615 North 23rd Street, Philadelphia, Pa.

STREET IN NUTLEY, N. J., TREATED TO ELIMINATE WEEDS

Eliminating Weeds from Slightly Traveled Roads

Roads, gutters and paths which are lightly traveled must be kept clear of weeds, if the appearance of a cemetery or park is to be maintained. The chemical method is to-day recognized from the economical standpoint as the only practical one for controlling undesirable weed growth. The Reade Manufacturing Company, 135 Hoboken Avenue, Jersey City, N. J., some time ago developed "Herbicide," which is used as a liquid to treat the roadway and gutter. It sinks into the ground, reaching and destroying the tops and roots of all existing growth, and having a sterile effect on the soil. It may be diluted heavily with water and applied with the use of a sprinkling equipment of any kind.

The old method of sending men over roadways with picks, hoes, shovels and scrapers to remove weeds is recognized by practice to be an absolute failure. By this method the tops only are removed. The roots remain in the ground and become strengthened, so that there is an abundance of regrowth after the first rain. Constant repetition of the work is therefore necessary during the entire growing season if the roads are to be kept clean. What is even more objectionable is the fact that the roadway is constantly disturbed, thereby creating a dust and making it impossible to keep a hard and smooth surface. The constant attention required makes the hand method costly when figured over one or more seasons.

The weed destroyer may be applied at any time during the growing season. It is advisable, however, to wait until all the weeds have made their appearance, and apply on a warm rather than a cold day, as circulation in plant life is more complete in warm weather. The solution is diluted with one part to 40 or 50 of water, to enable the weeds to absorb it more readily. One gallon of the material covers from 500 to 1,000 square feet of ground. The exact amount required is determined by the nature and thickness of the growth to be destroyed, and experimenting in a small way before using any quantity broadcast is the best method of attacking the problem. It is distributed easily with an ordinary sprinkling can or with a barrel sprinkling equipment. A single application properly made destroys all existing growth. Too light an application, however, might mean that some slight regrowth would be experienced. This does not always, however, warrant retreatment. The following year one application should give a clean road for the growing ing season.

The American Highway Educational Bureau

James W. Brooks, well known for his educational propaganda in behalf of good roads while head of the Editorial Bureau of the Federal Highway Council, has resigned from that organization to become director of the American Highway Educational Bureau. Mr. Brooks announces that the change was made for the purpose of conducting highway educational work along more intensive and effective lines, supporting the Federal Aid construction of state and county systems as the logical first step in highway development.

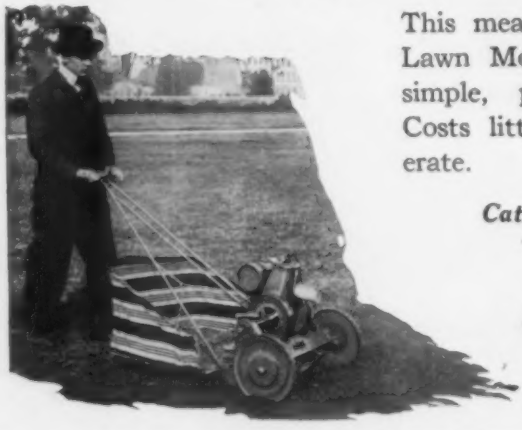
The production of "The Changing Road," the first standard road film ever undertaken, is now under way. The film is to be comprehensive in scope and official in character, and will be released during the early summer. It will portray the evolution of road construction and administration from primitive to modern methods, with the aim of educating the public away from cheap and uneconomical construction and of visualizing to taxpayers the real work which their state and county highway officials are striving to do in their behalf. This film will make a most interesting production for local good roads organizations and chambers of commerce, and for educational purposes in schools and among civic organizations.

New Municipal Engineering Firm

The new firm of McClure-Greene Engineering Company, 612-613 Park Building, Worcester, Mass., has been organized to specialize in municipal engineering, including waterworks, sewers and sewage disposal, streets, pavements, concrete structures, bridges and dams, hydro-electric development and its associated structures. The members of this firm have had unusual opportunities in their respective lines. Frederick A. McClure was for 28 years City Engineer of the city of Worcester. Earl W. Greene, a graduate of Worcester Polytechnic Institute, has had 19 years' experience in railroad, municipal and concrete engineering, and George M. Wright has been associated with the Wright Wire Company since its organization 37 years ago as General Manager and President.

ON A PERFORMANCE BASIS

The keeping of the lawns of parks and playgrounds in condition will be determined on a business basis. It will go to the machine which will do the most, the best and at the least expense.



This means the 4-ACRE Power Lawn Mower. It is mechanically simple, practically accident-proof. Costs little to buy and less to operate.

Catalog and information on request

Jacobsen Manufacturing Company

1302 Fifteenth St. Racine, Wis.

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CAST STEEL BRILLIANTLY LIGHTED ACCIDENT PROOF

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Madison Terminal Building, Chicago, Ill.

Added Police Protection for Banks

Hard times may not bring more crime, but they always bring a different type of crime. Swindles, frauds and like crimes flourish when times are good; robbery, violence and similar crimes increase when times are bad. Bank hold-ups in particular have increased within the last year, and city authorities have spent much time deciding how to prevent them.

The experience of the Cicero State Bank of Cicero, Ill., proves that the bandits can be fought successfully. Friday, April 15, six men drove up to the bank. The Vice-President, the Cashier, four other employes and three customers were in the bank. Five of the bandits entered and drove the customers and employes into the vault. As the Cashier stepped from his cage he pressed his foot on an electric button that carried the alarm straight to headquarters. Before the bandits had finished rifling the bank the police were at the door. One robber was slain, two were wounded, two captured, and a large money loss was prevented.

Prominent police officials claim that a direct connection to police headquarters that can be operated by foot, even while the employes are covered by revolvers, is the one really effective protection. Scores of banks in the leading cities now have this protection. Over one hundred and seventy-five banks in Detroit are connected directly to police headquarters, and a separate register is provided to receive the calls.

A study of the banks in Cleveland showed that the signal could be transmitted to police headquarters in six seconds and that the police could get to the majority of the banks within one minute. Within three minutes they could reach the bank furthest away. Forty banks are having the system installed.

The dozen banks in Buffalo, N. Y., have had this protection for twenty years. In addition, they have a watch service in connection with it. The central office is located at the Second Precinct police station, and three watchmen report in regularly at night, Sundays and holidays.

Lorain, Ohio, Lynn, Mass., Richmond, Va., and a number of other cities are giving this protection to the banks at no expense to the cities and a very small expense to the bankers.

The system is manufactured by The Gamewell Company, which has manufactured and installed many police signaling systems throughout the country.

War Memorials

Memorial projects in connection with the late war will undoubtedly continue to occupy the attention of communities and organizations all over the country for some time. Large communities and organizations are able to employ architects and sculptors of national reputation to design and produce their memorials. There are, however, hundreds of smaller communities which are unable to command the services of such architects and sculptors, and which need the services of an organization of artisans which can produce memorials of distinctive and artistic design. The Department of Bronze Tablets and Memorials of the Flour City Ornamental Iron Company, Minneapolis, Minn., has endeavored to build up such an organization to effectively serve the smaller communities in particular.

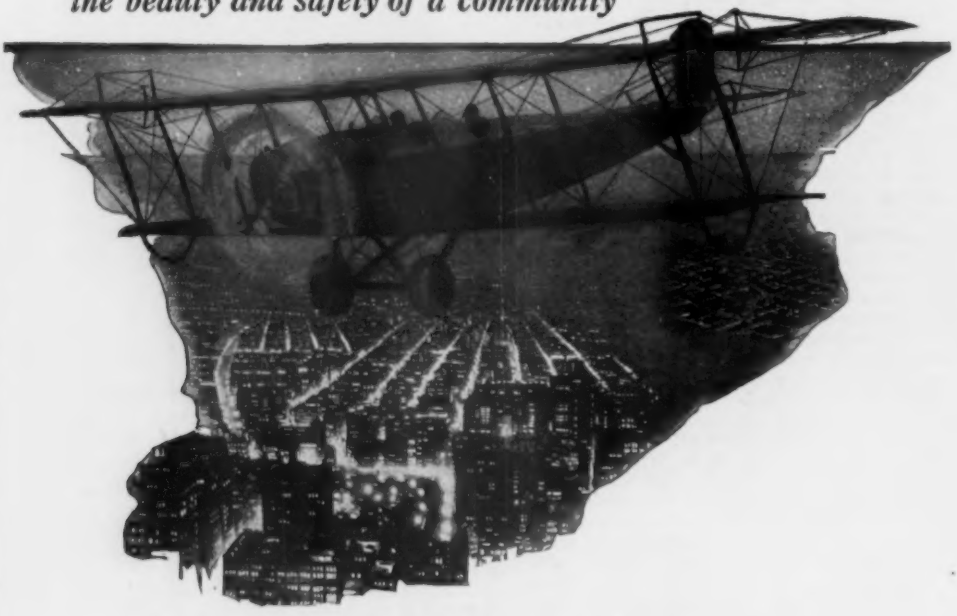
A DIGNIFIED, ARTISTIC AND EFFECTIVE TYPE OF MEMORIAL TABLET

The production of bronze memorials and statues is a highly specialized field of art which is limited to a skillful few in every age. In the United States the Flour City Ornamental Iron Company has gathered specialists in the production of bronze memorials, believing that memorials should be truly everlasting and distinctive. This company now occupies a 5-acre plant and employs skilled designers and draftsmen as well as sculptors and modelers of marked originality and accepted standing. It has a staff and production facilities probably unsurpassed in the country. Bronze work of almost any design and size is handled in as short a time as is consistent with its high grade of workmanship. Some idea of the artistic skill and facilities of this organization may be gained from the fact that it produces not only bronze memorial tablets and honor rolls, but bronze statuary, bas relief, and municipal and county memorial monuments, as well as ornamental bronze work for Federal, state and municipal buildings.

New Offices for Austin-Western

The Austin-Western Road Machinery Company has recently moved its offices to the new Wrigley Building, 400 North Michigan Boulevard, Chicago, Ill., where it has much more commodious quarters than at its old location at 910 South Michigan Avenue.

Does the attractiveness of your city die with the setting sun? Modern street lighting is an important factor in the beauty and safety of a community



Proper street lighting makes any city a bright spot on the map

WHEN a late birdman soars over your city, does he look down on a town ablaze with light? When a stranger steps off a night train, does your city beam him a welcome?

A city's attractiveness at night is largely dependent on its lighting. Carefully designed, well-placed fixtures transform once ugly streets into handsome highways. Dangerous localities are made safe and cheerful. Better business, increased property values, finer civic pride, all these things come with better lighting.

Floodlighting is another means of adding charm to a city's night-time vista. Monuments, public buildings, towers and playgrounds are given 24-hour beauty and usefulness by properly directed beams from floodlighting projectors.

This combination of beauty and efficiency in community lighting has developed into a science. Lighting specialists, men trained and experienced in city illumination, study your particular problems and recommend the type of lighting suited to your needs. The General Electric Company maintains just this sort of service—for your community.

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